Vol. 1119 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

1790 ***Celebrating 200 Years of Creativity*** 1990

PATENTS

October 16, 1990

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

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Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1118 O.G. 14 on Sept. 11, 1990.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on September 1, 1990 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1116 O.G. 32 on July 17, 1990.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	502.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	122.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	154.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Aug. 16, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on October 13, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,698,844 through 4,700,402
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on October 11, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,408,355 through 4,409,688
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED AUGUST 5, 1990
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,342,130	06/228,825	8/03/82
4,342,145	06/267,466	8/03/82
4,342,173	06/220,567	8/03/82
4,342,174	06/254,966	8/03/82
4,342,213	06/222,393	8/03/82
4,342,227	06/219,685	8/03/82
4,342,249	06/217,343	8/03/82
4,342,259	06/252,395	8/03/82
4,342,309	06/223,288	8/03/82
4,342,320	06/267,757	8/03/82
4,342,323	06/220,124	8/03/82
4,342,324	06/234,483	8/03/82
4,342,331	06/225,967	8/03/82
4,342,343	06/247,628	8/03/82
4,342,374	06/220,763	8/03/82
4,342,391	06/232,917	8/03/82
4,342,399	06/234,721	8/03/82
4,342,402	06/263,414	8/03/82
4,342,413	06/231,656	8/03/82
4,342,432	06/229,662	8/03/82
4,342,433	06/236,870	8/03/82
4,342,440	06/264,353	8/03/82
4,342,461	06/257,211	8/03/82
4,342,479	06/217,212	8/03/82
4,342,583	06/219,147	8/03/82
4,342,597	06/241,060	8/03/82
4,342,600	06/222,078	8/03/82
4,342,616	06/235,207	8/03/82
4,342,622	06/237,510	8/03/82
4,342,626	06/230,596	8/03/82
4,342,638	06/221,406	8/03/82
4,342,649	06/234,879	8/03/82
4,342,654	06/275,875	8/03/82
4,342,656	06/271,012	8/03/82
4,342,663	06/231,771	8/03/82
4,342,674	06/256,431	8/03/82
4,342,687	06/300,405	8/03/82
4,342,700	06/231,482	8/03/82
4,342,702	06/264,759	8/03/82
4,342,726	06/286,357	8/03/82
4,342,728	06/225,904	8/03/82
4,342,730	06/256,899	8/03/82
4,342,731	06/253,579	8/03/82
4,342,733	06/223,591	8/03/82
4,342,738	06/295,214	8/03/82
4,342,775	06/233,961	8/03/82
4,342,779	06/257,316	8/03/82
4,342,802	06/222,171	8/03/82
4,342,816	06/256,419	8/03/82
4,342,818	06/218,972	8/03/82
4,342,831	06/252,351	8/03/82
4,342,876	06/219,184	8/03/82
4,342,936	06/218,591	8/03/82
4,342,961	06/235,660	8/03/82
4,342,976	06/228,155	8/03/82
4,343,009	06/261,295	8/03/82
4,343,012	06/221,223	8/03/82
4,603,444	06/660,731	8/05/86
4,603,447	06/703,170	8/05/86
4,603,451	06/728,195	8/05/86
4,603,453	06/707,805	8/05/86
4,603,458	06/711,208	8/05/86
4,603,461	06/682,982	8/05/86
4,603,463	06/762,489	8/05/86
4,603,467	06/733,260	8/05/86
4,603,472	06/694,295	8/05/86
4,603,476	06/587,455	8/05/86
4,603,493	06/653,569	8/05/86
4,603,497	06/586,207	8/05/86
4,603,499	06/750,926	8/05/86
4,603,500	06/665,731	8/05/86
4,603,501	06/694,293	8/05/86
4,603,507	06/231,590	8/05/86
4,603,508	06/743,311	8/05/86
4,603,513	06/675,957	8/05/86
4,603,518	06/716,893	8/05/86
4,603,520	06/693,372	8/05/86
4,603,521	06/548,458	8/05/86
4,603,531	06/675,925	8/05/86
4,603,533	06/513,175	8/05/86
4,603,542	06/668,204	8/05/86
4,603,545	06/765,707	8/05/86
4,603,549	06/703,839	8/05/86
4,603,562	06/645,284	8/05/86
4,603,570	06/559,639	8/05/86
4,603,579	06/646,645	8/05/86

Patent Number	Serial Number	Issue Date
4,603,590	60/738,776	8/05/86
4,603,593	06/702,712	8/05/86
4,603,594	06/615,772	8/05/86
4,603,605	06/741,034	8/05/86
4,603,606	06/629,083	8/05/86
4,603,611	06/628,393	8/05/86
4,603,621	06/778,909	8/05/86
4,603,622	06/688,914	8/05/86
4,603,623	06/645,355	8/05/86
4,603,624	06/734,978	8/05/86
4,603,626	06/669,678	8/05/86
4,603,635	06/682,686	8/05/86
4,603,637	06/666,785	8/05/86
4,603,642	06/676,496	8/05/86
4,603,645	06/647,076	8/05/86
4,603,648	06/608,232	8/05/86
4,603,656	06/669,809	8/05/86
4,603,658	06/676,083	8/05/86
4,603,659	06/759,825	8/05/86
4,603,665	06/723,058	8/05/86
4,603,667	06/672,706	8/05/86
4,603,676	06/601,231	8/05/86
4,603,685	06/506,542	8/05/86
4,603,686	06/770,126	8/05/86
4,603,687	06/520,916	8/05/86
4,603,689	06/712,189	8/05/86
4,603,708	06/649,943	8/05/86
4,603,715	06/672,662	8/05/86
4,603,723	06/654,784	8/05/82
4,603,725	06/643,954	8/05/86
4,603,730	06/393,748	8/05/86
4,603,731	06/674,052	8/05/86
4,603,735	06/661,937	8/05/86
4,603,737	06/770,434	8/05/86
4,603,739	06/693,487	8/05/86
4,603,748	06/710,916	8/05/86
4,603,752	06/680,941	8/05/86
4,603,759	06/735,937	8/05/86
4,603,767	06/649,289	8/05/86
4,603,775	06/467,656	8/05/86
4,603,781	06/539,262	8/05/86
4,603,785	06/673,013	8/05/86
4,603,791	06/697,053	8/05/86
4,603,792	06/630,230	8/05/86
4,603,797	06/812,276	8/05/86
4,603,799	06/685,020	8/05/86
4,603,826	06/608,245	8/05/86
4,603,836	06/712,765	8/05/86
4,603,838	06/765,250	8/05/86
4,603,840	06/690,590	8/05/86
4,603,845	06/596,783	8/05/86
4,603,852	06/538,785	8/05/86
4,603,855	06/222,164	8/05/86
4,603,857	06/578,850	8/05/86
4,603,858	06/668,413	8/05/86
4,603,859	06/657,782	8/05/86
4,603,860	06/731,463	8/05/86
4,603,861	06/650,882	8/05/86
4,603,862	06/581,231	8/05/86
4,603,869	06/670,567	8/05/86
4,603,870	06/751,599	8/05/86
4,603,871	06/760,758	8/05/86
4,603,872	06/731,870	8/05/86
4,603,874	06/755,852	8/05/86
4,603,875	06/769,554	8/05/86
4,603,877	06/723,438	8/05/86
4,603,881	06/700,594	8/05/86
4,603,884	06/737,100	8/05/86
4,603,899	06/760,248	8/05/86
4,603,903	06/642,843	8/05/86
4,603,906	06/731,016	8/05/86
4,603,908	06/655,850	8/05/86
4,603,909	06/480,615	8/05/86
4,603,910	06/591,683	8/05/86
4,603,927	06/630,027	8/05/86
4,603,931	06/681,599	8/05/86
4,603,933	06/697,029	8/05/86
4,603,939	06/643,854	8/05/86
4,603,948	06/571,116	8/05/86
4,603,949	06/657,093	8/05/86
4,603,972	06/625,410	8/05/86
4,603,976	06/501,723	8/05/86
4,603,979	06/662,425	8/05/86
4,603,983	06/798,176	8/05/86
4,603,986	06/271,378	8/05/86
4,603,988	06/618,212	8/05/86
4,603,993	06/676,801	8/05/86
4,603,995	06/694,619	8/05/86
4,604,007	06/697,205	8/05/86
4,604,010	06/634,531	8/05/86
4,604,011	06/794,966	8/05/86
4,604,013	06/691,414	8/05/86
4,604,014	06/630,157	8/05/86
4,604,022	06/595,978	8/05/86
4,604,024	06/674,690	8/05/86
4,604,026	06/561,418	8/05/86
4,604,034	06/606,016	8/05/86
4,604,037	06/682,333	8/05/86
4,604,040	06/707,075	8/05/86
4,604,050	06/584,511	8/05/86
4,604,053	06/715,678	8/05/86
4,604,057	06/751,903	8/05/86
4,604,061	06/719,826	8/05/86
4,604,066	06/774,132	8/05/86
4,604,067	06/673,773	8/05/86
4,604,070	06/807,202	8/05/86
4,604,071	06/622,331	8/05/86
4,604,072	06/627,534	8/05/86
4,604,079	06/668,744	8/05/86
4,604,084	06/738,800	8/05/86
4,604,085	06/587,347	8/05/86
4,604,099	06/694,189	8/05/86
4,604,101	06/703,699	8/05/86
4,604,107	06/669,974	8/05/86
4,604,108	06/325,703	8/05/86
4,604,122	06/780,058	8/05/86
4,604,136	06/615,879	8/05/86
4,604,147	06/651,237	8/05/86
4,604,155	06/418,919	8/05/86
4,604,163	06/788,360	8/05/86
4,604,165	06/465,687	8/05/86
4,604,168	06/684,268	8/05/86
4,604,172	06/762,930	8/05/86
4,604,195	06/603,136	8/05/86
4,604,202	06/686,379	8/05/86
4,604,206	06/782,823	8/05/86
4,604,232	06/712,170	8/05/86
4,604,236	06/713,156	8/05/86
4,604,237	06/673,300	8/05/86
4,604,238	06/680,195	8/05/86
4,604,244	06/603,257	8/05/86
4,604,246	06/685,033	8/05/86
4,604,252	06/610,195	8/05/86
4,604,255	06/504,899	8/05/86
4,604,259	06/777,768	8/05/86
4,604,261	06/626,519	8/05/86
4,604,271	06/781,819	8/05/86
4,604,279	06/773,030	8/05/86
4,604,298	06/700,683	8/05/86
4,604,309	06/379,795	8/05/86
4,604,314	06/694,776	8/05/86
4,604,330	06/562,319	8/05/86
4,604,335	06/708,891	8/05/86
4,604,337	06/675,785	8/05/86
4,604,347	06/577,090	8/05/86
4,604,350	06/485,327	8/05/86
4,604,360	06/459,049	8/05/86
4,604,387	06/525,797	8/05/86
4,604,399	06/675,789	8/05/86
4,604,400	06/649,980	8/05/86
4,604,415	06/684,083	8/05/86
4,604,428	06/568,922	8/05/86
4,604,443	06/728,968	8/05/86
4,604,444	06/662,518	8/05/86
4,604,445	06/724,693	8/05/86
4,604,461	06/772,096	8/05/86

Patent No.	Serial No.	Issue Date
4,604,462	06/771,866	8/05/86
4,604,468	06/634,446	8/05/86
4,604,485	06/616,895	8/05/86
4,604,489	06/602,577	8/05/86
4,604,505	06/735,274	8/05/86
4,604,511	06/609,477	8/05/86
4,604,567	06/540,418	8/05/86
4,604,569	06/510,353	8/05/86
4,604,576	06/474,193	8/05/86
4,604,582	06/689,072	8/05/86
4,604,608	06/711,877	8/05/86
4,604,609	06/714,470	8/05/86
4,604,630	06/662,823	8/05/86
4,604,634	06/833,671	8/05/86
4,604,636	06/493,701	8/05/86
4,604,648	06/660,275	8/05/86
4,604,655	06/544,245	8/05/86
4,604,661	06/668,066	8/05/86
4,604,664	06/462,911	8/05/86
4,604,679	06/708,819	8/05/86
4,604,686	06/574,438	8/05/86
4,604,717	06/467,645	8/05/86
4,604,718	06/488,095	8/05/86
4,604,725	06/495,389	8/05/86
4,604,734	06/501,338	8/05/86
4,604,752	06/283,181	8/05/86
4,604,754	06/557,288	8/05/86

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1), and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptence Date
4,360,187	06/275,267	11/23/82	6/19/81	6/06/90
4,446,877	06/308,464	5/08/84	10/05/81	9/10/90
4,461,308	06/273,132	7/24/84	6/12/81	9/10/90
4,513,893	06/358,852	4/30/85	3/10/82	9/10/90
4,524,262	06/462,400	6/18/85	1/31/83	9/05/90
4,541,652	06/634,222	9/17/85	7/25/84	9/10/90
4,579,514	06/634,824	4/01/86	7/26/84	9/10/90
4,531,346	06/428,178	7/30/85	9/29/82	9/10/90
4,580,964	06/634,606	4/08/86	7/26/84	9/10/90
4,566,986	06/646,012	1/28/86	8/31/84	8/21/90
4,532,040	06/605,750	7/30/85	5/10/84	9/12/90
4,538,850	06/473,102	9/03/85	3/07/83	9/12/90

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

4,577,956, Re. S. N. 07/570,999, Filed Aug. 22, 1990, Cl. 355, PROCESS FOR THE CHAOTIC FILMING OF DOCUMENTS AND DEVICE FOR THE COMPLETION THEREOF, Rolf Klosterhuber, Owner of Record: *Inventor*, Attorney or Agent: David J. Cushing, Ex. Gp.: 211

4,726,356, Re. S. N. 07/483,456, Filed Feb. 2, 1990, Cl. 128/20, CARDIOVASCULAR AND THORACIC RETRACTOR, Albert E. Santilli, et al., Owner of Record: *Kapp Surgical Instruments, Warrensville, Ohio;* Attorney or Agent: Wayne D. Porter, Jr., Ex. Gp.: 334

4,765,352, Re. S. N. 07/571,141, Filed Aug. 23, 1990, Cl. 134/99, PORTABLE ISOLATION ENCLOSURE FOR USE IN CLEANING CONTAMINATED ENVIRONMENTS, Jerome F. Strieter, Owner of Record: *Southern Concepts, Inc., Hyattsville, Md.*, Attorney or Agent: Edward S. Irons, Ex. Gp.: 242

4,766,176, Re. S. N. 07/573,501, Filed Aug. 24, 1990, Cl. 525/100, STORAGE STABLE HEAT CURABLE ORGANSILOXANE COMPOSITIONS CONTAINING MICROENCAPSULATED PLATINUM-CONTAINING CATALYSTS, Chi-Long Lee, et al., Owner of Record: *Dow Corning Corp., Midland, Mich.*, Attorney or Agent: Robert Spector, Ex. Gp.: 151

4,767,354, Re. S. N. 07/569,951, Filed Aug. 20, 1990, Cl. 439/413, SELF-STRIPPING ELECTRICAL CONNECTOR, Yves Satigny, Owner of Record: *Capano & Pons, Cluses (Haute-Savoie), France*, Attorney or Agent: Herbert Dubno, Ex. Gp.: 322

4,767,651, Re. S. N. 07/573,905, Filed Aug. 28, 1990, Cl. 428/35, MULTIPLE LAYER FILM AND CONTAINERS THEREROM, John F. Starczewski, et al., Owner of Record: *American National Can Co., Chicago, Ill.*, Attorney or Agent: Thomas A. O'Rourke, Ex. Gp.: 158

4,769,680, Re. S. N. 07/573,400, Filed Aug. 24, 1990, Cl. 354/043, APPARATUS AND METHOD FOR MAKING LARGE AREA ELECTRONIC DEVICES, SUCH AS FLAT PANEL DISPLAYS AND THE LIKE, USING CORRELATED, ALIGNED DUAL OPTICAL SYSTEMS, Griffith L. Resor, et al., Owner of Record: *MRS Technology, Inc., Chelmsford, Mass.*, Attorney or Agent: Haynes N. Johnson, Ex. Gp.: 211

4,769,819, Re. S. N. 07/578,178, Filed Sept. 6, 1990, Cl. 371/38, TWO STAGE CODING METHOD, Kiyoshi Matsutani, et al., Owner of Record: *Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Michael K. Mutter, Ex. Gp.: 236

4,776,765, Re. S. N. 07/573,820, Filed Aug. 28, 1990, Cl. 416/214.00R, MEANS AND METHOD FOR REDUCING SOLID PARTICLE EROSION IN TURBINES, William J. Summer, et al., Owner of Record: *General Electric Co., New York, N.Y.*, Attorney or Agent: Larry S. Nixon, Ex. Gp.: 341

4,777,914, Re. S. N. 07/573,271, Filed Aug. 27, 1990, Cl. 123, VALVE OPERATING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE, Tsuneo Knno, Owner of Record: *Honda Kogyo Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: John F. Carney, Ex. Gp.: 342

4,813,138, Re. S. N. 07/575,510, Filed Aug. 30, 1990, Cl. 30/41, FOUNTAIN SHAVING DEVICE, Teng-Mo Chen, Owner of Record: *Inventor*, Attorney or Agent: A.D. Messenheimer, Ex. Gp.: 324

4,825,730, Re. S. N. 07/573,813, Filed Aug. 28, 1990, Cl. 81/57.39, FLUID OPERATED WRENCH, John K. Junkers, Owner of Record: *Inventor*, Attorney or Agent: Michael J. Striker, Ex. Gp.: 323

4,831,625, Re. S. N. 07/577,372, Filed Aug. 31, 1990, Cl. 371/51.1, EASILY CASCADABLE AND TESTABLE CACHE MEMORY, Edison H. Chiu, et al., Owner of Record: *Texas Instruments Inc., Dallas, Tex.*, Attorney or Agent: David H. Tannanbaum, Ex. Gp.: 236

4,844,559, Re. S. N. 07/573,691, Filed Aug. 28, 1990, Cl. 303/119, ELECTRICALLY OPERATED SOLENOID VALVE, Anthony W. Harrison, Owner of Record: *Lucas Industries, Birmingham, England*, Attorney or Agent: Edward A. Pennington, Ex. Gp.: 312

4,848,268, Re. S. N. 07/575,346, Filed Aug. 30, 1990, Cl. 118/227, APPARATUS AND METHOD FOR APPLYING A LIQUID TO A MOVING WEB, Hans-Peter Sollinger, et al., Owner of Record: *J. M. Voith GmbH, Heidenheim, Federal Republic of Germany*, Attorney or Agent: Robert C. Faber, Ex. Gp.: 134

4,854,244, Re. S. N. 07/576,907, Filed Aug. 31, 1990, Cl. 104/279, TRANSIT RAIL DEICING SYSTEM, Thomas R. Rhodes, et al., Owner of Record: *General Signal Corp.*, Attorney or Agent: Robert R. Hubbard, Ex. Gp.: 312

4,867,601, Re. S. N. 07/578,007, Filed Aug. 31, 1990, Cl. 404/26, STURDY ADJUSTABLE MANHOLE COVER SUPPORT, Harold M. Bowman, Owner of Record: *Inventor*, Attorney or Agent: Daniel J. Sammon, Ex. Gp.: 356

4,903,581, Re. S. N. 07/576,684, Filed Aug. 31, 1990, Cl. 98/2.4, ARRANGEMENT FOR PREVENTING MIST AND ICE FORMATION ON THE SIDE WINDOW OF A MOTOR VEHICLE, Sten Nilsson, Owner of Record: *Saab-Scania AB, Trollhattan, Sweden*, Attorney or Agent: Robert C. Faber, Ex. Gp.: 344

4,904,318, Re. S. N. 07/570,595, Filed Aug. 21, 1990, Cl. 156/64, METHOD FOR MANUACTURE OF DIAPHRAGM AND APPARATUS THEREFORE, Fumio Goto, et al., Owner of Record: *Toyado Gosei Co., Ltd., Mishikasugai, Japan*, Attorney or Agent: G. Lloyd Knight, Ex. Gp.: 134

4,919,022, Re. S. N. 07/578,363, Filed Sept. 4, 1990, Cl. 81/464, RATCHET WRENCH, Akira Ono, et al., Owner of Record: *Ingersoll-Rand Co., Woodcliff Lake, N.J.*, Attorney or Agent: Walter C. Vliet, Ex. Gp.: 323

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,044,187, Reexam. No. 90/002,124, Requested Sept. 5, 1990, Cl. 428/212, FILM LAMINATES HAVING A REIRRADIATED LAYER, William P. Kremkau, Owner of Record: *W.R. Grace & Co.-Conn., New York, N.Y.*, Attorney or Agent: Richard B. Racine, Finnegan, Henderson, Farabow, et al., Washington, D.C., Ex. Gp.: 158, Requester: Owner

4,422,745, Reexam. No. 90/002,128, Requested Sept. 10, 1990, Cl. 354/105, CAMERA SYSTEM, Talmadge W. Hopson, Owner of Record: *National School Studios, Inc., Minneapolis, Minn.*, Attorney or Agent: David R. Fairbairn, Kenney & Lange, Minneapolis, Minn., Ex. Gp.: 211, Requester: Owner

4,486,857, Reexam. No. 90/002,127, Requested Sept. 10, 1990, Cl. 364/900, DISPLAY SYSTEM FOR THE SUPPRESSION AND REGENERATION OF CHARACTERS IN A SERIES OF FIELDS IN A STORED RECORD, Paul C. Heckel, Owner of Record: *Quickview Partners, Los Altos, Calif.*, Attorney or Agent: Phillips, Moore, Lempio & Fenley, San Francisco, Calif., Ex. Gp.: 232, Requester: Owner

4,631,557, Reexam. No. 90/002,125, Requested Sept. 6, 1990, Cl. 346/140, INK JET EMPLOYING PHASE CHANGE INK AND METHOD OF OPERATION, Theodore M. Cooke, et al., Owner of Record: *Dataproducts Corp., Woodland Hills, Calif.*, Attorney or Agent: Stuart Lubitz, Spensley, Horn, Jubas & Lubitz, Los Angeles, Calif., Ex. Gp.: 216, Requester: Owner

4,876,835, Reexam. No. 90/002,130, Requested Sept. 7, 1990, Cl. 052/239, WORK SPACE MANAGEMENT SYSTEM, James O. Kelley, et al., Owner of Record: *Herman Miller, Inc., Zeeland, Mich.*, Attorney or Agent: Jeffery M. Duncan, Willian, Brinks, Olds, Hoffer, et al., Chicago, Ill., Ex. Gp.: 354, Requester: Owner

4,884,694, Reexam. No. 90/002,126, Requested Sept. 7, 1990, Cl. 206/484.100, GAS-STERILIZABLE PACKAGE, COVER OF AND ARRANGEMENT FOR PRODUCING THE SAME, Karl Heinz Sengewald, Owner of Record: *Inventor, Federal Republic of Germany*, Attorney or Agent: Striker, Striker & Stenby, New York, N.Y., Ex. Gp.: 241, Requester: Kenpak Inc., City of Commerce, Calif.

4,926,605, Reexam. No. 90/002,129, Requested Sept. 10, 1990, Cl. 052/063, CONSTRUCTION ASSEMBLY FOR CLOSURE STRUCTURE, Les Milliken, et al., Owner of Record: *Les & K. Blair Milliken, Englewood, Fla.*, Attorney or Agent: Ernest I. Gifford, Gifford, Groh, Sheridan, et al., Birmingham, Mich., Ex. Gp.: 354, Requester: Steel Stitch Corp., Marietta, Ga.

NOTICE OF RECLASSIFICATION AND REQUEST FOR COMMENTS

Pursuant to 35 U.S.C. 9, the art classified in Class 364, *Electrical Computers and Data Processing Systems*, subclasses 200, *General Purpose Programmable Digital Computer Systems*, 513, *Artificial intelligence (e.g. speech and signal conditioning, self-organizing robot control)*, 518, *Control of data presentation*, through 523 (all of the indented subclasses under subclass 518), and 900, *Miscellaneous digital data processing systems*, is undergoing reclassification. Documents currently classified in these subclasses will be reclassified into a new class - tentatively entitled, *Information Processing System Organization*. Subclasses 200, 513, 518-523 and 900 will then be abolished. In a seperate reclassification project, Class 364, subclass 300 has already been abolished and the art contained therein has been reclassified into appropriate other existing subclasses in Class 364. This was done by Classiication Order No. 1365, efective June 5, 1990.

The creation and use of the tentative new class is intended to follow the standard rules and practices of the U. S. Patent and Trademark Office Classification System. In this regard, a tentative hierarchical array (schedule) or primary subclasses, usually referred to as outdented subclasses or "outdents", has been developed for the new class, and appears later in this Notice along with a definition of the class and for each proposed subclass. Indented subclasses will be developed for each outdent in the course of the reclassification project, documents in each outdent being assigned to appropiate indented subclasses.

The tentative new outdented subclasses listed below were developed based on a review of claimed embodiments of U. S. patents currently assigned as originals in the aforementioned subclasses under reclassification, and are intended primarily to provide for the claimed subject matter of patents. Thus, the first occurring subclass (starting from the top of the schedule) which explicitly provides for any portion of the subject matter of any

claim of a patent properly classifiable in the new class will become the "original" classification of that patent.

The public is invited to comment in writing on the proposed new class title, its definition, its tentative schedule of subclasses and the subclass definitions which are set forth below. Comments and suggestions should be submitted before November 13, 1990 and should be addressed to: Mr. Kendall Dood, Chemical-Electrical Classification Group, U. S. Patent and Trademark Office, Washington, D.C. 20231.

INFORMATION PROCESSING SYSTEM ORGANIZATION

Schedule of Subclasses

1 COMMUNICATION AMONG PROCESSING SYSTEMS
2 INFORMATION TRANSFER WITH BUFFERING FUNCTIONS
3 INTERCONNECTION TECHNIQUES FOR COMMUNI CATION CONTROL
4 I/O PROCESSING
5 INSTRUCTION PROCESSING
6 STORAGE ADDRESS FORMATION
7 STORAGE ACCESSING AND CONTROL
8 COMPATIBLITY/SIMULATION/EMULATION
9 TIMING
10 RELIABILITY
11 DATABASE AND FILE MANAGEMENT SYSTEM
12 PROCESSING MANAGEMENT
13 SYSTEM UTILITIES
14 ARTIFICIAL INTELLIGENCE
15 CONTROL PROCESSING
16 PROCESSING SYSTEM ARCHITECTURE

Definition of the Class

I. GENERAL STATEMENT OF THE CLASS SUBJECT MATTER

This is the generic class for processing systems and corresponding methods for performing information processing functions; and methods for controlling operations of said processing systems.

II. SCOPE OF THE CLASS

This class is limited to processing systems and functions which are concerned solely with the movement of non-specified information and the processing thereof, among any one or combination of processing elements, memory elements, I/O elements and processing systems. Where the systems are concerned with movement of a specific type of information and processing thereof or a specific end use for the information external to this class, see the SEARCH CLASS notes below.

This class is limited to processing systems and functions in which memory element(s) are addressed or accessed by processing or I/O elements. For the internal structure of the memory element(s), see the SEARCH CLASS notes below.

This class is limited to systems in which further significant processing occurs in addition to that involving error detection and correction. For systems directed solely to error detection and correction, see the SEARCH CLASS notes below.

This class is limited to systems in which further significant processing occurs in addition to mutiplexing and communication of information. For systems directed solely to multiplexing and for systems directed solely to addressing and communication between processing systems via a communication medium, see the search NOTES below.

SEARCH CLASS:

340, Communications, Electrical, subclasses 825+ for systems directed solely to addressing and communication between processing systems via a communication medium.

364, Electrical Computers and Data Processing Systems, appropriate subclasses, for systems concerned with movement of a specific type of information and processing thereof, or a specific end use for the information other than provided for in this Class (364).

365, Static Information Storage and Retrieval, appropriate subclasses, for the internal structure of memory elements *per se*.

370, Multiplex Communications, appropriate subclasses, for systems directed solely to multiplexing.

371, Error Detection/Correction and Fault Detection/Recovery, appropriate subclasses, for systems directed solely to error detection and correction.

III. GLOSSARY

Information:
Intelligence used to control and provide the basis for data processing. It includes address, data, control and status.

Instruction:
Coded information for causing a processing element to perform one or more of its operations.

Processing element:
Apparatus which performs control, arithmetic, and/or logical operations.

Processing function:
Operations which cause a predefined sequence of events to occur.

Memory element:
Apparatus which provides storage of information.

Input/output element:
Apparatus which carries out necessary operations for transferring information between processing elements and/or memory elements, and external elements.

Processing system:
An arrangement of processing element(s), memory element(s), and I/O element(s) which coordinate to acomplish information procesing function(s).

Subclass Definitions

1 COMMUNICATION AMONG PROCESSING SYS TEMS:

Subject matter under the class definition wherein multiple processing systems communicate via a communication medium and significant information processing occurs.

(1) Note. Each processing system typically contains an element dedicated to facilitating communication with another processing system.

2 INFORMATION TRANSFER WITH BUFFERING FUNCTIONS:

Subject matter under the class definition including means or steps, involving buffering structure or operations, which change the speed of information exchange among any combination of processing element(s), memory element(s) and I/O element(s).

SEARCH THIS CLASS, SUBCLASS:

7, for control of a buffer store without information transfer.

3. INTERCONNECTION TECHNIQUES FOR COMMUNICATION CONTROL:

Subject matter under the class definition including details of the communication of control, address or data information via an interconnection medium among any combination of processing element(s), memory element(s) and I/O element(s).

(1) Note. This subclass includes arbitration for access to a bus only. For other types of arbitration see the search notes to other subclasses in this class below.
(2) Note. This subclass includes interfaces between compatible elements. i.e., elements that can communicate information without any format changes or translation. For interfaces between incompatible elements, see the search notes to other subclasses in this class below.

SEARCH THIS CLASS, SUBCLASS:

8, for interfaces between incompatible elements.
15, for types of arbitration other than that referred to in (1) Note above.

4 **I/O PROCESSING:**

Subject matter under the class definition including details of input/output elements or functions.

5 **INSTRUCTION PROCESSING:**

Subject matter under the class definition including details of instruction decoding and manipulation.

6 **STORAGE ADDRESS FORMATION:**

Subject matter under the class definition including details of means or methods for forming memory addresses.

7 **STORAGE ACCESSING AND CONTROL:**

Subject matter under the class definition including details in the control of access to memory elements and the accessing of memory elements.
(1) Note. This subclass provides, for example, for DMA and arbitration for access to memory.

8 **COMPATIBLITY/SIMULATION/EMULATION:**

Subject matter under the class definition including details of means or steps by which any one or combination of processing element(s), memory element(s) and I/O element(s) is made compatible with another, or made to simulate/emulate another processing system element.
(1) Note. This subclass includes interfaces between incompatible elements. i.e., elements that require format changes before communication can take place. For interfaces between compatible elements, subclass 3 above.

9 **TIMING:**

Subject matter under the class definition including details of means or steps by which any one or combination of processing element(s), memory element(s), and/or I/O element(s) are regulated according to a periodic sequence.
(1) Note. This subclass provides, for example, for timing generation.

10 **RELIABILITY:**

Subject matter under the class definition including details of means or steps by which any one or combination of processing element(s), memory element(s) and I/O element(s) cooperate to achieve a fail-safe environment.
(1) Note. This subclass provides for power failure fail-safe functions.

SEARCH THIS CLASS, SUBCLASS:

15, for power reduction functions.

11 **DATABASE AND FILE MANAGEMENT SYSTEM**

Subject matter under the class definition comprising means or methods to control the addressing, retrieval and manipulation of data stored in a processing system.
(1) Note. This subclass provides, for example, for data sorting and handling.

12 **PROCESSING MANAGEMENT:**

Subject matter under the class definition including means or steps for controlling of operations of a plurality of cooperating processing elements or plurality of processes.
(1) Note. This subclass provides, for example, for load balancing and scheduling.

13 **SYSTEM UTILITIES:**

Subject matter under the class definition including specific means or steps to control the operation of any processing element, memory element or I/O element.
(1) Note. This subclass provides, for example, for operating systems, initialization and boot-strapping.

14 **ARTIFICIAL UTILITIES**

Subject matter under the class definition wherein the processing system or method has the capacity to perform functions that are normally associated with intelligence, such as recognition, reasoning, learning and self-improvement.
(1) Note. This subclass provides, for example, for robot control and knowledege processing.

15 **CONTROL PROCESSING:**

Subject matter under the class definition comprising means or steps for sequencing the operation of a process ing.
(1) Note. This subclass provides, for example, for arbitration, power reduction and interrupt-handling schemes.

16 **PROCESSING SYSTEM ARCHITECTURE:**

Subject matter under the class definition which includes processing system(s) having any combination or interconnection of processing element(s), memory element(s) and I/O element(s) not provided for above.
(1) Note. This subclass provides, for example, for MIMD, vector and array processors.

Reinstatement to Register

The following list of persons, whose names have been previously removed from the Register of Attorneys and Agents pursuant to the provisions of 37 CFR 10.11(b), have been reinstated in view of the required fee and information they have furnished to the Office of Enrollment and Discipline.

Alexander, Robert S., Engelhard Corp., 33 Wood Ave., S., Edison, N.J. 08818
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Sept. 14, 1990 CAMERON WEIFFENBACH, *Director*
Office of Enrollment & Discipline

Removal from Register

Pursuant to the provisions of 37 CFR § 10.11(b), a letter was directed on June 15, 1990 to Donald I. Makinson, Fetherstonhaugh & Co., P.O. Box 2999, Station D, Ottawa, K1P 5Y6, Canada, the last post office address furnished by him to the Office of Enrollment and Discipline. No reply was received within the period of twenty(20) days therein set.

Accordingly, his name is being removed from the Register of Attorneys and Agents.

Sept. 14, 1990 CAMERON WEIFFENBACH, *Director*
Office of Enrollment and Discipline

Erratum

"All reference to Patent No. 4,917,275 to Robert Bolen et al. of Closter, N.J. for `DISPENSING CLOSURE' appearing in the Official Gazette of April 17, 1990 should be deleted since no patent was granted."

Conversion of PTO Telephone Numbers

Effective October 13, 1990, the Patent and Trademark Office organizations in the Crystal Plaza buildings will convert from the existing 557 exchange to either a 308 or 603 exchange. Organizations in Crystal Plaza buildings 2, 3, 3/4 and 4 will convert to a 308 exchange. Organizations in Crystal Plaza buildings 1 and 6 will convert to a 603 exchange.

The C&P Telephone Company has arranged for a 90-day intercept service to be activated on October 13 to coincide with the telephone number conversion. The intercept service is designed to provide the caller with the new telephone number for those calls made to 557 numbers that have been converted. For example, if a call comes in to a 557 number that has been converted to the new 308 exchange, the intercept service will notify the caller of the new 308 telephone number.

This conversion will affect all of the Patent Examining Groups, Trademark Law Offices, and a number of support groups located in the designated buildings.

A copy of the PTO Organizational Directory which captures changes occurring since the directory was last published, as well as the new telephone numbers for those organizations affected by the conversion is provided. For your information, some of the more frequently called organizations are listed below:

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Patent Public Search Room	(703) 308-0595
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Assignment Branch	(703) 308-0017
Application Branch	(703) 308-0921
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SAE Helen Childs rm 8C13 CP2 308-0210

121 Five, four or three membered ring, azoles, certain acids, esters heterocyclic organic chemistry, nitriles, and azo chemistry
Mary C. Lee rm 8A19 CP2 308-0409
122 Nitrogen containing heterocyclic compounds, six, seven or more ring members
Mukund Shah rm 8B32 CP2..... 308-1256
123 Six membered hetrocyclics and oxygen containing hetrocyclic compounds
Frederick Waddell rm 8B10 CP2 .. 308-1235
124 Organic carboxylic acids, esters and organometallics
Jose Dees rm 8A09 CP2 308-0092
125 Pharmaceuticals methods and compounds
Stanley Friedman rm 8B02 CP2 308-0119
126 Carbo, oxy, aldehyde, keto and hapo compounds
Donald Moyer rm 7D01 CP2 308-0252
129 Pesticides, amines and cosmetics
Glennon H. Hollrah rm 8D31 CP2 308-0322

130 Specialized Chemical Industries and Chemical Engineering rm 8C17 CP3 308-0651

Director Barry S. Richman rm 8D19 CP3 .. 308-1193
Secretary Vickie Beach rm 8D19 CP3 308-1193
General Information/Receptionist rm 8C17 CP3 308-0651
SAC Ola Simms rm 8C17 CP3 308-3835

131 Adhesive bonding and miscellaneous chemical manufacture
Michael W. Ball rm 9E02 CP3 308-0651
132 Food or edible material, processes, compositions and products
Donald E. Czaja rm 8D01 CP3 308-0651
133 Paper making and fiber liberation, glass manufacture, gas, heating and illumination apparatus and processes, minerals, oil apparatus and coating apparatus
Richard V. Fisher rm 8B36 CP3 308-0651

134 Compositions, methods and apparatus for etching in chemical manufacture, metal treating, and adhesive bonding
David Simmons rm 9E16 CP3 308-0651

135 General molding or treating apparatus, static molds gas, separation, gas and liquid contact
Jay H. Woo rm 8D35 CP3 308-0651

136 Liquid purification or separation and processes of plastic and non-metallic article shaping or treating
Richard A. Dawson rm 7A09 CP3 .. 308-0651

137 Processes of plastic and nonmetallic article shaping or treating
Jan H. Silbaugh rm 8A01 CP3 308-0651

138 Liquid purification or separation, concentrating apparatus and processes and-separating and assorting solids - froth flotation
Stanley S. Silverman rm 7D11 CP3 308-0651

139 Coating processes
Norman Morgenstern rm 7D17 CP3 308-0651

150 High Polymer Chemistry, Plastics, Coating, Photography, Stock Materials and Compositions rm 11C19 CP2 308-2351

Director James O. Thomas, Jr.
rm 11A04 CP2 308-2359
Secretary Cheryl P. Gibson
rm 11A04 CP2 308-2359
Deputy Director John E. Kittle
rm 11B16 CP2 308-2428
General Information/Receptionist
rm 11C19 CP2 308-2351
SAC Kathryn Perry rm 11B14 CP2 308-2365
Special Program Examiner Wibert Briggs
rm 11A12 CP2 308-2396
Program Analyst Sharon C. Graham
rm 11D31 CP2 308-2391
Paralegal Irene Weaver rm 11D31 CP2 308-2390
Deputy Director Secreatary (Vacant)
rm 11B16 CP2 308-2351

151 Mixed synthetic resin compositions, block and graft copolymers
John Bleutge rm 11B02 CP2 308-2368

152 Drug, Bio-affecting and body treating compositions
Merrell Cashion rm 10A10 CP2 308-2367

153 Foams, condensation polymers of cellulose, phenols, isocyanates, polyesters, polyepoxides, stabilization of polymers
John Kight, III rm 10A22 CP2 308-2453

154 Stock materials or miscellaneous articles of manufacture
George Lesmes rm 11E16 CP2 308-2362

155 Polymer compositions, addition polymers, and carbohydrates
Joseph L. Schofer rm 10E02 CP2 .. 308-2452

156 Radiation imagery chemistry - silver halide and diazo-photosentitive compositions and processes
Paul Michl rm 10D02 CP2 308-2451

157 Radiation imagery chemistry - photopolymerization, irradiation of polymers and electrophotography
Marion McCamish rm 10D32 CP2 308-3961

158 Stock materials or miscellaneous articles and record receivers
Ellis Robinson rm 11E02 CP2 308-2364

180 Biotechnology rm 9C13 CP2 308-0196

Director Edward E. Kubasiewicz
rm 9A09 CP2 308-1123
Secretary Betty Kaminsky
rm 9A09 CP2 308-1123
Deputy Director Charles F. Warren
rm 9D01 CP2 308-2928
General Information/Receptionist
rm 9C13 CP2 308-0196
SAC Ellen Scott rm 9C13 CP2 308-1175

181 Chemical apparatus such as analyzers, reactors and sterilizers; processes of chemical and clinical analysis, sterilizing and preserving; liquid purifications or separation by living organisms
Robert Warden rm 5A15 CP2 308-2920

182 Clinical chemistry, microbiology, immunology and enzymology, purification and chemical engineering
Esther Kepplinger rm 6A01 CP2 .. 308-1219

183 Peptide and carbohydrate chemistry, and drug, bioaffecting and body treating compositions containing peptides, carbohydrates, and undetermined constitution
Johnnie R. Brown rm 6D01 CP2 .. 308-1179

184 Multicellular organisms (animal/plant), molecular genetics, cell culture, hybridoma, plant and animal molecular biology, microbiology, protozoa and algae
Elizabeth Weimar rm 9B32 CP2 .. 308-0254

185 Molecular genetics and molecular biology of bacteria and fungi genetic engineering and vectors, enzyme production
Richard Schwartz rm 9D31 CP2 .. 308-1083

186 Proteins, antibody, antigen chemistry and drug, bioaffecting and body treating compositions containing proteins
Margaret Moskowitz rm 9A01 CP2 308-0452

187 Nucleic acid assays, AIDS assays, immunology, chemical assay standards, fermentation apparatus
Robert Wax rm 5D33 CP2 308-2454

188 Enzymes, fermentation, microbiology, drug, bioaffecting and body treating compositions containing enzymes or animal extracts of undetermined compositions
(Vacant) rm 5D33 CP2 308-2454

ELECTRICAL EXAMINING GROUPS

210 Industrial Electronics, Physics and Related Elem. rm 9C17 CP4 308-1782

Director Donald G. Kelly rm 9D19 CP4 308-0658
Secretary Danita L. Ingram
rm 9D19 CP4 308-0658
General Information/Receptionist
rm 9C17 CP4 308-1782
SAE Romaine D. Bowling
rm 9C17 CP4 308-2930

211 Photography, photocopying, motion pictures, electric and magnetographic recorders, optics, capacitors
L. Thomas Hix rm 9B40 CP4 308-2969

212 Electrical motor-generator structure, piezoelectricelements and devices, generator systems, battery and condenser charging and discharging, power supply regulation, conversion systems, and music
Steven L. Stephans rm 9A01 CP4 308-3778

213 Conductors, insulators, inductors, electromagnets, magnetic and thermal switches, electric lamp and discharge devices, industrial electric furnaces, acoustics and register
Leo P. Picard rm 10D01 CP4 308-3304

214 Electrical switches and arc suppression, heating by induction, plasma and electric discharge machining, protection of elec-

trical systems and devices, electromagnetic control systems, electric charge devices and systems, electrical component housing and mounting and, electrical transmission systems, electrical elevator controls, and prime mover dynamo plants
A. David Pellinen rm 10D17 CP4 .. 308-3301

215 Electric photocopying and coating apparatus
Arthur T. Grimley rm 9E16 CP4 308-2968

216 Recorders, scales, electric heating, electric welding, resistors and pictorial communications
Bruce A. Reynolds rm 10B02 CP4 308-3305

217 Motor control systems, coded data generation or conversion and horology
William M. Shoop Jr rm 9D01 CP4 308-0905

220/290 Special Laws Administration & Designs rm 11D17 CP3 308-0766

Director Robert E. Garrett rm 11D17 CP3 308-0753
Secretary Tereta Gilchrist rm 11D19 CP3 308-0765
General Information/Receptionist Group 220 rm 11C17 CP3 308-0766
General Information/Receptionist Group 290 rm 1106 CP6 308-0744
SAC Joanne Hodge rm 11D11 CP3 308-3518
Licensing and Review Hilda Grimes rm 11D09 CP3 308-1714
Mildred Scott rm 11D08 CP3 308-1715

221 Weapons (firearms, ordnance, ammunition, explosive devices), aeronautics and ships as well as all classified mechanical applications
Deborah L. Kyle rm 11A15 CP3 308-0918

222 Radio, optic, acoustic, wave communications systems and all classified electrical applications
Thomas H. Tarcza rm 11D35 CP3 .. 308-1689

223 Chemical specials use compositional including five extinguishing and retarding earth boring and well treating, liquid crystals, colloids and dispersants, preservative agents, and microcapsule and body treating radioactive as well as classified chemical applications
Robert L. Stoll rm 11E02 CP3 308-1701

224 Chemical engineering including radioactive materials, powder metallurgy rocket fuels, explosives, thermal and photoelectric batteries, and nuclear reactors systems and related technologies, and classified chemical applications
Brooks H. Hunt rm 11A01 CP3 308-1682

291 Ornamental designs in the area of industrial arts
Wallace R. Burke rm 11E02 CP6 .. 603-0569

292 Ornamental designs for fine arts
Bernard Ansher rm 11A02 CP6 603-0558

293 Ornamental designs, industrial/fine arts
Bruce Dunkins rm 1215-1 CP6 603-0555

294 Ornamental designs, industrial/fine arts
A. Hugo Word rm 11B04 CP6 603-0571

230 Information Processing, Storage and Retrieval rm 11C17 CP4 308-0754

Director Gerald Goldberg rm 11D37 CP4 308-1785
Secretary Teresa E. Dugan rm 11D37 CP4 308-1785
General Information/Receptionist rm 11C17 CP4 308-0754
SAC Katherine A. Nelson rm 11C17 CP4 308-1322

231 Computer data presentation systems, digital arithmetic circuitry, speech analysis and synthesis systems
Gary V. Harkcom rm 10E16 CP4 .. 308-2826

232 General and special purpose digital data processing systems
Archie E. Williams Jr. rm 11B02 CP4 308-0538

233 Static information storage and retrieval and elements of dynamic magnetic information storage
Stuart N. Hecker rm 11D01 CP4 .. 308-0079

234 Ordnance or weapon system computers and special applications of computers including vehicle control, navigation, measuring, testing and monitoring
Parshotam S. Lall rm 11D17 CP4 .. 308-1373

235 Electrical dynamic information storage and retrieval and record controlled systems
(Vacant) rm 11D11 CP4 308-3126

236 Computer control systems, computers in business, computers in medicine, computer aided product manufacturing, analog and hybrid computers, and error correction and detection systems
Jerry Smith rm 11E10 CP4 308-3101

237 General and special purpose digital data processing systems
Gareth D. Shaw rm 11B40 CP4 308-3103

238 Artificial intelligence, general purpose programmable digital computer systems, computers in earth science, games and social sciences, and miscellaneous digital data processing systems
Michael R. Fleming rm 10E06 CP4 308-1691

239 Systems controlled by data bearing records, coded record sensors, record controlled calculators, dynamic information storage or retrieval and telephone answering machines
Stuart S. Levy rm 11D35 CP4 308-0725

240 Packages, Cleaning, Textiles and Geometrical Instruments rm 6C17 CP4 308-0771

Director Trygve M. Blix rm 6D37 CP4 308-0777
Secretary Donna P. Magaha rm 6D37 CP4 308-0777
General Information/Receptionist rm 6C17 CP4 308-0771
SAE Doretha A. Marcelli rm 6D15 CP4 308-0771

241 Packaging art including glass, fabric, metal, wood, paper and plastic receptacles plus closures
Stephen Marcus rm 6B02 CP4 308-1499

242 Fluid treating, presses, food apparatus, cleaning, agitating, centrifuges, and web feeding
Harvey C. Hornsby rm 7A15 CP4 308-1374

243 Conduits, bathroom facilities, cleaning apparatus, filling apparatus, switches, and article carriers
Henry J. Recla rm 6B30 CP4 308-1382

244 Special receptacles or packages, shoes and shoe making
Paul T. Sewell rm 7D19 CP4 308-1543

245 Textiles, winding and reeling, pushing and pulling, bearings, and flexible torque transmitters
Daniel P. Stodola rm 7E16 CP4 308-2673

246 Measuring and testing, dynamic information storage or retrieval, optical image projectors and joint packing
William A. Cuchlinski rm 6E14 CP4 308-3873

247 Textile and leather manufacture, apparel, and textiles
Werner H. Schroeder rm 6D01 CP4 308-0949

250 Electronic and Optical Systems and Devices rm 8D17 CP4 308-0956

Director Joseph J. Rolla rm 8D19 CP4 308-0530
Secretary Deborah P. Leeper rm 8D19 CP4 308-0530
General Information/Receptionist rm 8C17 CP4 308-0956
SAC JoAnn Davis rm 8C19 CP4 308-1578

251 Lasers, fiber optic devices and antennas
William L. Sikes rm 8E02 CP4 308-0700
252 Electronic modulators, demodulators, oscillators, amplifiers, tuners and wave transmission lines and networks
Eugene R. Laroche rm 8B34 CP4 .. 308-2878
253 Semiconductor devices
Andrew J. James rm 7B02 CP4 308-1610
254 Semiconductor and vacuum tube circuits and systems and electronic and electromechanical counting circuits and systems
Stanley D. Miller rm 7E02 CP4 308-1532
255 Optical measuring and testing systems and photocell circuits
Davis L. Willis rm 8A15 CP4 308-1393
256 Radiant energy systems
Janice A. Howell rm 8B02 CP4 308-0612
257 Optical systems and elements and vision-testing and correcting
Bruce Y. Arnold rm 7B12 CP4 308-0758
258 Semiconductor devices
Rolf Hille rm 7B12 CP4 308-1598

260 Communications, Measuring, Testing and Lamp/Discharge Group rm 5D19 CP4 308-0962

Director Stewart J. Levy (Acting) rm 5D19 CP4 308-2802
Secretary Iyone L. Miles-Brooks rm 5D19 CP4 308-2802
General Information/Receptionist rm 5C14 CP4 308-0962
SAC Vivian C. Harris rm 5D21 CP4 308-0525

261 Telegraphy, telephony and audio systems
Jin F. Ng rm 4D01 CP4 308-2991
262 Television and television facsimile
James J. Groody rm 4B02 CP4 308-2912
263 Multiplex communications, digital communications and telecommunications
Douglas W. Olms rm 5E02 CP4 308-0305
264 Electrical communications and acoustic wave systems
Donald J. Yusko rm 6E02 CP4 308-2126
265 Measuring and testing of non-electrical phenomenon
Hezron E. Williams (Acting) rm 5B24 CP4 308-2674
266 Image analysis
David K. Moore rm 5B02 CP4 308-2686
267 Measuring and testing of electrical phenomenon
Reinhard J. Eisenzopf rm 5D01 CP4 308-2696
268 Condition responsive communications, measuring and testing
Joseph A. Orsino rm 5D01 CP4 308-0979
269 Selective Visual Display/Facsmile
Alvin E. Oberley rm 4B16 CP4 308-3255

MECHANICAL EXAMINING GROUPS

310 Handling and Transporting Media rm 5D19 CP3 308-1113

.Director Bobby R. Gray rm 5D17 CP3 308-1134
Secretary Annette L. Pray rm 5D19 CP3 308-1134
General Information/Receptionist rm 5C17 CP3 308-1113
SAE Margaret Stevens rm 5D14 CP3 308-1113

311 Conveyors, article dispensing, elevators, and sheet feeding or delivering devices
Robert Olszewski rm 5A01 CP3 .. 308-2588
312 Motor vehicle wheels and bodies, fluid conveying, fire extinguishers and handling implements
Margaret Focarino rm 4D35 CP3 .. 308-0885
313 Brakes, fluid pressure brake systems, spring devices railways, and railway equipment
Robert Oberleitner rm 5B18 CP3 .. 308-2569
314 Spraying devices and land and motor vehicles
Andres Kashnikow rm 5D01 CP3 308-1137
315 Aeronautics and marine arts
Joseph F. Peters, Jr. rm 5E02 CP3 308-2561
316 Land and motor vehicles
Charles Marmor rm 6A01 CP3 308-0361
317 Article handling, check-controlled apparatus, railway track and switches, coin handling, dumping vehicles, merchandizing and freight accomodation
Robert J. Spar rm 5D35 CP3 308-2555
318 Dispensing and article assorting
Michael Huppert rm 5D11 CP3 308-1107

320 Material Shaping, Article Manufacturing, Tools rm 6C17 CP3 308-1148

Director Nicholas P Godici rm 6D19 CP3 .. 308-1078
Secretary Laura Dorsey rm 6D19 CP3 308-1078
General Information/Receptionist rm 6C17 CP3 308-1148
SAE Vera Thomas rm 6C17 CP3 308-2326

321 Metal deforming, packaging machinery, butchering and woodworking
Robert Spruill rm 7E02 CP3 308-3837
322 Electrical connectors, gear cutting, milling and chucks
(Vacant) rm 6D35 CP3 308-1152
323 Abrading, workholders, tools and paper manufactures
Frederick Schmidt rm 7D35 CP3 .. 308-2333
324 Cutting, cutlery, tools, bookmaking, and printed matter
Frank T. Yost rm 6E02 CP3 308-2058
325 Metal founding, metal turning, miscellaneous hardware, fishing, vermin trapping and welding
Richard K. Seidel rm 6D01 CP3 308-2319
326 Metal working, comminution and wire working
Howard Goldberg rm 7A01 CP3 .. 308-3852

330 Surgery, Plant and Animal Husbandry, Amusement and Exercise Devices and Printing rm 4C17 CP4 308-2192

Director John J. Love rm 4D19 CP4 308-0873
Secretary Norma L. Watson rm 4D19 CP4 308-0873
General Information/Receptionist rm 4C17 CP4 308-0858
SAE Clara S. Desmukes rm 4D21 CP4 .. 308-2192
PTO Facsmile Center rm 3D56 CP34 .. 308-1353
Paper Correlating Center rm 3C04 CP4 308-2645

331 Surgical instruments, toys, coating implements
Robert Hafer rm 3A01 CP3 308-2121

332 Exercising and therapy devices, tobacco, artificial body parts, orthopedics, and educational devices
Richard Apley rm 4E16 CP4 308-1065
333 Dentistry, animal husbandry, and toiletries
Gene Mancene rm 3E02 CP3 308-2156
334 Amusement games and medical therapy
Edward Coven rm 3E02 CP3 308-0871
335 Surgery diagnostics
Kyle Howell rm 4E02 CP4 308-3256
336 Surgery instruments, medicators or receptors
C. Fred Rosenbaum rm 3D39 CP4 308-0495
337 Printing, typewriting, surgery-respiratory
Edgar Burr rm 3D01 CP3 308-3144
338 Prosthetic devices, medical apparatus
Randall Green rm 4D25 CP4 308-1006
339 Surgical instruments and medicators
Stephen Pellegrind rm 3D35 CP4 .. 308-1015

340 Solar, Heat, Power and Fluid Engineering Devices rm 3C17 CP4 308-0861

Director Carlton R. Croyle (Acting) rm 3D19 CP4 308-0975
Secretary Carol A. Laroda rm 3D19 CP4 308-0975
General Information/Receptionist rm 3C17 CP4 308-0861
SAE Verlene D Green rm 3C17 CP4 308-0861

341 Expansible chamber motors and fluid power systems, impellers and fluid reaction devices
Edward K. Look rm 3B22 CP4 308-1044
342 Internal combustion engines including charge forming and ignition systems
Charles J. Myhre rm 2D01 CP4 308-1946
343 Jet engines of the air-breathing type, aerospace propulsion systems including solid and liquid fueled rockets; electric and electromagnetic types, gas turbine power plants for vehicles and stationary power generation, turbocharged, supercharged and rotary internal combustion engines, rotary expanisible chamber devices, and pumps including expansible chamber, fluid entrainment, and motor-driven types
Carlton R. Croyle rm 3B02 CP4 308-0102
344 Environmental control, including heating, drying, air conditioning, refrigeration, ventilation and controls
Albert J. Makay rm 3D01 CP4 308-0101
346 Devices and methods for illumination, exhaust gas treatment of internal combustion engines, power plants of the type using natural heat, lubrication, stoves and furnaces including heating the environment and extracting heat from the sun, and combustion
Ira S. Lazarus rm 2B02 CP4 308-1935
347 Fluid handling which includes valves, pressure regulators and flow controllers for liquids and gases, heat exchange, and methods for transferring heat from one material to another
Martin P. Schwadron rm 2B42 CP4 308-2597

350 General Construction, Petroleum and Mining Engineering rm 3C17 CP3 308-2168

Director Al Lawrence Smith rm 3D19 CP3 .. 308-1020
Secretary Fran E. Lynah rm 3D19 CP3 308-1020
General Information/Receptionist rm 3C17 CP3 308-2168
SAE Joyce G. Hill rm 3D13 CP3 308-3765

351 Joints and connections, pipe couplings, fences, earth and hydraulic engineering
Randolph A. Reese rm 4D01 CP3 308-2498
352 Gearing, power transmissions, clutches, machine elements
Leslie A. Braun rm 2B36 CP3 308-0830
354 Bldgs structures and components
David A. Scherbel rm 2D35 CP3 .. 308-2144
355 Supports, racks, fire escapes, ladders, scaffolds, flexible partitions
Carl D. Friedman rm 4E02 CP3 308-0331
356 Petroleum, mining, highway and bridge engineering, well drilling, and endless belts
Ramon S. Britts rm 4A01 CP3 308-0839
357 Tables, chairs, cabinets, windows, doors, buckles, buttons, clasps
Kenneth J. Dorner rm 3E16 CP3 .. 308-0866
358 Fasteners, safes, locks, closure fasteners, beds, control levers and linkages
Gary L. Smith rm 4D17 CP3 308-0827

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Paralegal Assistant Darlene Bullock
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Paralegal Assistant Sarah Hyde
rm 3C06 CP2 308-0928

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Managing Attorney Law Office II
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Senior Attorney Craig Morris, Mary Hannon
Supervisory Applications Managing Attorney Law Office III
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Senior Attorney Jody Drake, Robert Freely, Patrick Hines
Supervisory Applications Examiner Jackie Perry
Managing Attorney Law Office IV
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Senior Attorney John Demos, Terry Ellen Holtzman
Supervisory Applications Examiner Sharon Wilson
Managing Attorney Law Office V
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Senior Attorney Sharon Marsh, Terry Rupp, Ronald Sussman
Supervisory Applications Examiner Thurmond Streater
Managing Attorney Law Office VI
Mary Sparrow rm 3C27 CP2 308-1031
Senior Attorney Robert Crowe, Mary Kay McDonald
Supervisory Application Examiner Janice Martin
Managing Attorney Law Office VII
Thomas Howell rm 4C13 CP2 308-1807
Senior Attorney Michael Hamilton, David Shallant, Michelle Wiseman
Supervisory Applications Examiner Karen McCray
Managing Attorney Law Office VIII
Sidney Moskowitz rm 4C11 CP2 308-1812
Senior Attorney Michael Bodson, David Stine
Supervisory Applications Examiner Ada Rollins
Managing Attorney Law Office IX
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Senior Attorney Ira Goodsaid, Jean Logan
Supervisory Applications Examiner Deborah Mays
Post Registration Law Office Managing Attorney
Jackie Cole rm 6C24 CP2 308-0483
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Secretary Sophia Brock
rm 6C27 CP2 308-1819
Quality Review Clerk Deborah Ahmed
rm 6C27 CP2 308-1819
Publication & Issue Supervisor
Valarie Bean rm 6C27 CP2 308-1817
Affidavit Examiners rm 6C27 CP2 308-0485
Renewal Examiners rm 6C27 CP2 308-0485
Mail Reader/Messenger rm 6C27 CP2 308-1827
Microfilm Section rm 6C27 CP2 308-1825
Intent-To-Use Managing Attorney
Frank Hellwig rm 4C27 CP2 308-4061

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G. Douglas Hohein rm 1008 CS5 557-3551
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Gladys R. Springer rm 1008 CS5 557-3551
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Sheila H. Veney rm 1008 CS5 557-3551

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Secretary Dee Dee Walker rm 908 PK2 557-3055
Program Analyst
Joan S. Griffey rm 908 PK2 557-2290

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Secretary Peggy Fewell rm 803 PK1 .. 557-0183
Deputy Director G. William Richardson
rm 803 PK1 557-0183
Security/Safety Officer
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CM2	Crystal Mall 2, 1921 Jefferson Davis Highway
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CP3	Crystal Plaza 3, 2021 Jefferson Davis Highway
CP4	Crystal Plaza 4, 2201 Jefferson Davis Highway
CP6	Crystal Plaza 6, 2221 Jefferson Davis Highway
CP34	Crystal Plaza 34, 2021 Jefferson Davis Highway
CS5	Crystal Square 5, 1755 Jefferson Davis Highway
CG2	Crystal Gateway 2, 1225 Jefferson Davis Highway
PK1	Crystal Park 1, 2011 Crystal Drive
PK2	Crystal Park 2, 2121 Crystal Drive
ST	South Tower 2809 Jefferson Davis Highway
NT	North Tower 2805 Jefferson Davis Highway
EADS	1232 South Eads Street
FERN	1411 South Fern Street
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B1. 4,343,480	4,845,645	4,864,845	4,878,375
D. 303,372	4,845,862	4,864,872	4,879,749
D. 304,021	4,846,354	4,865,290	4,880,155
D. 307,816	4,846,650	4,865,291	4,880,198
4,585,445	4,846,940	4,865,621	4,880,461
4,625,845	4,848,552	4,865,808	4,880,623
4,699,926	4,849,525	4,865,906	4,880,744
4,738,518	4,849,779	4,865,919	4,881,082
4,772,982	4,849,832	4,866,067	4,881,121
4,773,410	4,851,642	4,866,321	4,881,273
4,784,064	4,852,081	4,866,878	4,881,330
4,790,637	4,852,383	4,866,957	4,882,401
4,797,300	4,852,920	4,867,027	4,882,865
4,801,825	4,854,716	4,867,161	4,882,890
4,804,005	4,854,721	4,867,169	4,883,091
4,804,600	4,856,699	4,867,273	4,883,281
4,805,788	4,857,228	4,867,352	4,883,585
4,811,286	4,857,730	4,867,807	4,884,376
4,811,719	4,857,900	4,868,239	4,885,414
4,813,461	4,858,285	4,868,410	4,885,585
4,814,813	4,858,988	4,868,762	4,885,866
4,814,969	4,859,602	4,868,911	4,885,949
4,817,202	4,859,669	4,869,036	4,885,956
4,824,830	4,860,092	4,869,093	4,886,135
4,826,672	4,860,322	4,869,857	4,886,469
4,827,396	4,860,502	4,870,014	4,886,781
4,827,962	4,861,026	4,870,091	4,886,797
4,828,472	4,861,435	4,870,560	4,887,766
4,829,798	4,861,446	4,871,121	4,888,019
4,831,278	4,861,455	4,871,152	4,888,338
4,831,279	4,861,504	4,872,755	4,888,802
4,831,882	4,861,708	4,873,037	4,888,850
4,833,300	4,862,139	4,873,106	4,889,055
4,833,587	4,862,173	4,873,279	4,889,158
4,834,089	4,862,174	4,873,515	4,889,223
4,837,324	4,862,203	4,873,843	4,889,256
4,837,364	4,862,479	4,874,445	4,889,692
4,840,253	4,863,028	4,874,446	4,890,974
4,840,949	4,863,069	4,874,529	4,891,231
4,842,354	4,863,327	4,875,528	4,891,791
4,843,425	4,863,443	4,875,564	4,898,425
4,843,480	4,863,582	4,876,744	4,906,439
4,844,133	4,863,715	4,877,337	4,908,645
4,845,421	4,863,927	4,878,151	
4,845,530	4,864,838	4,878,271	

Disclaimers

4,514,692.—*David E. Johnson*, Los Banos; *Richard W. Williams*, Dos Palos, both of Calif. METAL DETECTOR AND DISCRIMINATOR USING DIFFERENTIATION FOR BACKGROUND SIGNAL SUPPRESSION. Patent dated Apr. 30, 1985. Disclaimer filed May 29, 1990, by the assignee, FRL, Inc. d.b.a. Fisher Research Laboratory.

Hereby enters this disclaimer to claims 1, 2 and 6 of said patent.

4,839,060.—*Raymond N. Yong*, Beaconsfield; *Amar J. Sethi*, Fort McMurray, both of Canada. METHYLATED STARCH COMPOSITIONS AND THEIR USE AS FOLCCULATING AGENTS FOR MINERAL WASTED, SUCH AS BAUXITE RESIDUES. Patent dated June 13, 1989. Disclaimer filed June 20, 1990, by the assignee, Suncor, Inc.

Hereby enters this disclaimer to claims 3, 4, 6, and 8 through 16. of said patent.

4,877,098.—*Nobuyoshi Asanuma*, Saitama, Japan. AUTOMATIC ROAD WHEEL STEERING SYSTEM. Patent dated Oct. 31, 1989. Disclaimer filed June 7, 1990, by the assignee, Honda Giken Kogyo Kabushiki Kaisha.

Herby enters this disclaimer to claims 1 through 4 of said patent.

4,879,276.—*Arthur D. Brewer*, Puslinch, Canada. METHOD FOR REDUCING SERUM URIC ACID LEVELS. Patent dated Nov. 7, 1989. Disclaimer filed July 23, 1990, by the assignee, Uniroyal Chemical Ltd./Uniroyal Chemical Ltee.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,882,888.—*William C. Moore*, Holliston, Mass. LAMINATED WALL CONSTRUCTION. Patent dated Nov. 28, 1989. Disclaimer filed June 29, 1990, by the assignee, Dryvit Systems, Inc.

Hereby enters this disclaimer to claims 1 through 3 of said patent.

4,950,372.—*David F. McCready*, Altoona, Pa. CATHODIC PROTECTIONS SYSTEM USING CARBOSIL ANODES. Patent dated Aug. 21, 1990. Disclaimer filed Aug. 29, 1990, by the assignee, Rust Evader Corp.

The term of this patent subsequent to May 9, 2006, has been disclaimed.

Disclaimer and Dedication

4,839,379.—*Jaroslav Stanek*, Birsfelden; *Ernst Schweizer*, Arlesheim, both of Switzerland. SUBSTITUTED AZABICYCLOALKANES, THE USE THEREOF, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM. Patent dated June 13, 1989. Disclaimer and Dedication filed July 19, 1990, by the assignee, Ciba-Geigy Corp.

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O. G. Notice

Introductory Training Session for Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures

The Patent and Trademark Office (PTO) is interested in identifying participants for a second introductory training session directed to the requirements for patent applications containing nucleotide sequence and/or amino acid sequence disclosures. The requirements are contained in the final rules, published in the *Federal Register*, 55 FR 18230 (May 1, 1990), and in the *Official Gazette*, 1114 O.G. 29 (May 15, 1990). The training session will focus on the requirements of the final rules, especially the submission of computer readable forms. The training session will assume familiarity with the final rules as well as the accompanying discussion and comments/responses. The content of this training session will be substantially the same as the training session that was held on September 14, 1990. The training session will be open to all interested persons; registration to practice before the PTO is not a requirement for participation. The training session will be held on Friday, October 19, 1990 from 2:00 p.m. until 5:00 p.m.in the PTO's Patent Academy - Crystal Park 1 - Room 501.

Requests to participate in the introductory training session should be made by telephone to Lois E. Boland; Special Program Examiner, Office of the Assistant Commissioner for Patents - Crystal Park 2, Suite 919, at (703) 557-8384.

10/3/90
Date

James E. Denny
Acting Assistant Commissioner
for Patents

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF August 25, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action

CHEMICAL EXAMINING GROUPS

GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director. 7-7-87
ORGANIC CHEMISTRY GROUP 120—JOHN F. TERAPANE, JR., Director 11-21-88
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP— 130 BARRY S. RICHMAN, Director 5-12-88
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director 12-14-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director 4-23-87

ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director 10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—ROBERT E. GARRETT, Director 8-15-88
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director 3-29-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director 12-22-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director. 9-18-88
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP— 260 STEWART LEVY, Acting Director 4-25-88
DESIGN, GROUP 290—ROBERT E. GARRETT, Director 1-21-87

MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director 7-3-89
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director 6-23-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director 10-25-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director 3-16-89
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350— A. L. SMITH, Director 10-1-89

Expiration of patents: The patents within the range of numbers indicated below expire during August 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,750,192 to 3,755,818 inclusive
Plant Patents ..... 3,385 to 3,394 inclusive

REEXAMINATIONS

OCTOBER 16, 1990

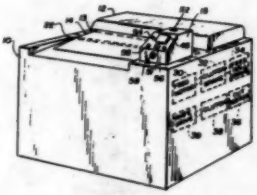
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B2 3,760,669 (1367th)

SHEET MATERIAL FEEDING AND CUTTING APPARATUS AND CONTROL SYSTEM THEREFOR

Ben J. Rosenthal, Skokie, and Earl Matsouka, Park Ridge, both of Ill., assignors to Rosenthal Manufacturing Company, Chicago, Ill.

Reexamination Request No. 90/001,505, May 5, 1988.
Reexamination Certificate for Patent No. 3,760,669, issued Sep. 25, 1973, Ser. No. 228,669, Feb. 23, 1972.
Reexamination Certificate B1 3,760,669, issued Nov. 3, 1987.
Int. Cl.[5] B26D *5/40*
U.S. Cl. 83—063



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim 12 is confirmed.

Claims 1–8 and 11 were previously cancelled.

Claims 9, 10, 15 and 16 are cancelled.

Claims 13 and 14 are determined to be patentable as amended.

New claim 17 is added and determined to be patentable.

12. Apparatus for feeding and cutting measured amounts of sheet material, including in combination,

feeding means for the sheet material including a feed roll, first drive means for said feed roll, said drive means including a first slow-acting brake means and a second brake means,

cutting means for cutting off the sheet material fed, second drive means coupled to said cutting means, said cutting means including a fixed blade and a movable blade, means for supporting said movable blade including arm means coupled to said second drive means, and a mounting for said movable blade pivotally coupled to said arm means and including spring means for biasing said movable blade against said fixed blade,

measuring means coupled to said feed roll and operating to provide an indication representing the movement of said feed roll, operating means coupled to said measuring means and responsive to said indication therefrom to produce a preliminary signal and a control operation in response to said measuring means producing an indication of said predetermined length, and

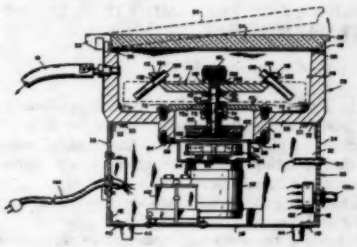
control means for controlling the operation of said first and second drive means, said control means being coupled to said operating means and being operative in response to said preliminary signal to actuate said first slow-acting brake means for slowing down said feed roll and to actuate said second brake means to stop said feed roll and to activate said second drive means in response to said control operation of said operating means.

B1 4,226,669 (1368th)

VACUUM CENTRIFUGE WITH MAGNETIC DRIVE

Frank Vilardi, Nesconset, N.Y., assignor to Savant Holdings, Inc., Farmingdale, N.Y.

Reexamination Request No. 90/001,964, Mar. 19, 1990.
Reexamination Certificate for Patent No. 4,226,669, issued Oct. 7, 1980, Ser. No. 37,429, May 9, 1979.
Int. Cl.[5] B01D *1/00*
U.S. Cl. 159—6.1



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–10 is confirmed.

1. A high speed centrifugal concentrator comprising a housing divided into a vacuum chamber and a base section,

said vacuum chamber having side and bottom walls, a cover constituting the top wall thereof, and means pivotally mounting one end of said cover on said vacuum chamber for movement between an upstanding open position and a closed position in which it closes off said vacuum chamber in sealed, air-tight condition,

a centrifuge rotor,

means mounting said centrifuge rotor for rotation within said vacuum chamber, said mounting means including a mounting shaft journalled on said vacuum chamber and secured to said rotor,

an electric drive motor for said centrifuge rotor mounted within said base section externally of said vacuum chamber and remote therefrom,

electric circuit means for controlling the operation of said motor and including means for dynamically braking said motor,

magnetic coupling means for providing a magnetic drive connection between said motor and said centrifuge rotor and creating a magnetic field passing through a wall of said vacuum chamber, whereby said centrifuge rotor is rotated within said vacuum chamber in response to operation of said drive motor,

said magnetic coupling means comprising a first permanent magnet member secured to said mounting shaft and having a plurality of permanent magnets mounted thereon, and a second permanent magnet member secured to the drive shaft of said motor and having a corresponding member of permanent magnets of opposite polarity mounted thereon,

and a safety interlock switch mounted on said vacuum chamber and operatively associated with said cover for energizing said means for dynamically braking said drive motor when said cover is in its open position.

B2 4,228,113 (1369th)

PROCESS FOR MAKING OBJECTS FROM MINERAL FILLERS BONDED WITH A THERMOSETTING RESIN

Rene L. E. van Gasse, Opglabbeek, Belgium, assignor to Stamicarbon B.V., Geleen, Netherlands

Reexamination Request No. 90/001,276, Jul. 1, 1987.
Reexamination Certificate for Patent No. 4,228,113, issued Oct. 14, 1980, Ser. No. 956,042, Oct. 31, 1978.
Reexamination Certificate B1 4,228,113, issued Apr. 22, 1986.
Claims priority, application Netherlands, Nov. 3, 1977, 7712108; Dec. 28, 1977, 7714465
Int. Cl.[5] B29D *9/00*
U.S. Cl. 264—24

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–14 are cancelled.

[1. In a process for moulding three-dimensionally shaped article from a molding material including the steps of
(1) forming a pliable sheet of molding material composed of a thermosetting resin, a hardener of said thermosetting resin and mineral fillers,
(2) transferring the thus formed sheet in a pliable condition to a mold; and
(3) subjecting the sheet to pressure at an elevated temperature to form a three-dimensionally shaped article,
the improvement wherein prior to step (2)
(a) at least a portion of the wall of the mold, under conditions of elevated temperature, is provided with at least one layer of a mixing of a powdery thermosetting resin and a catalyst for said resin,
(b) the applied resin of step (a) is allowed to melt and is polymerized at said elevated temperature, and
(c) the pliable sheet is inserted into the thus coated mold and subjected to pressure according to steps (2) and (3).]

B1 4,592,230 (1370th)

APPARATUS FOR AND METHOD OF DETERMINING THE LIQUID COOLANT LEVEL IN A NUCLEAR REACTOR

James P. Waring, Rockville, and Robert D. Smith, Bethesda, both of Md., assignors to Scandpower Inc., Bethesda, Md.

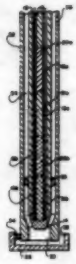
Reexamination Request No. 90/001,372, Nov. 6, 1987.
Reexamination Certificate for Patent No. 4,592,230, issued Jun. 3, 1986, Ser. No. 514,600, Jul. 18, 1983.
Int. Cl.[5] G01F *23/00*
U.S. Cl. 73—295

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 2, 3, 4, 5, 6, 7, 8 and 9 are determined to be patentable as amended.

New claims 10, 11, 12 and 13 are added and determined to be patentable.

1. An instrument for measuring liquid level within a liquid containing vessel comprising:
an elongated body having a longitudinal axis [extends] *extending* into [a] *at least a portion containing a liquid coolant inventory in the liquid containing vessel and into at least a portion containing gaseous or vaporous inventory in the* liquid containing vessel *and the elongated body being so disposed to extend* in a generally vertical direction;
electrical heating means extending coaxially down the longitudinal axis of the elongated body.
a plurality of difference thermocouples arranged within said elongated body,
each said difference thermocouple comprising a heated and unheated junction; and]
the electrical heating means formed of electrically conductive materials which comprise high *heating material* and low heating [materials] *material serially disposed and* located in alternate zones along the length of said [elongate] *elongated* body, *and forming a portion of an electrical current path of the electrical heating means,* the electrical heating means comprising a single slender rod which extends down *the longitudinal axis* of the length of the elongated body parallel to the longitudinal axis,
a plurality of difference thermocouples arranged peripherally of the electrical heating means within said elongated body,



each said difference thermocouple comprising a heated junction and an unheated junction, whereby
the heated junction of each said difference thermocouple is *located adjacent to and is* heated by [one] *the adjacent* zone of high heating material [located adjacent to the heated junction], and *whereby*
the unheated junction of each [of] said difference thermocouple is located adjacent to [one] *and is essentially and relatively unheated by the adjacent* zone of low heating material,
means including a shield having an upper extremity and a lower extremity and the shield means forming an annular space between the shield means and the elongated body for receiving liquid coolant inventory, and
means at the lower extremity having a space within which liquid coolant inventory remains and forms a seal for preventing the passage or escapement of gaseous or vaporous inventory through the space of the seal means.

B1 4,610,913 (1371st)

LONG WAFER WAFERBOARD

Derek Barnes, British Columbia, Canada, assignor to MacMillan Bloedel Limited, Vancover, Canada

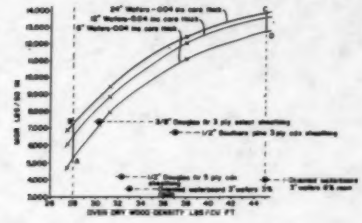
Reexamination Request No. 90/001,756, Apr. 20, 1989.
Reexamination Certificate for Patent No. 4,610,913, issued Sep. 9, 1986, Ser. No. 829,564, Feb. 14, 1986.
Continuation of Ser. No. 723,641, Apr. 16, 1985, abandoned.
Int. Cl.[5] B32B *5/02, 5/16, 21/02*
U.S. Cl. 428—215

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–15 is confirmed.

1. A waferboard panel with increased strength properties

comprising at least three layers of wood wafers, having an initial aggregate specific gravity less than about 0.6 oven dry weight with volume at 12% moisture content, the panel having face layers on outside surfaces and at least one core layer, the wafers in the face layers having a mean orientation in the range of about 2° to 10°, the wafers in the face layers having lengths



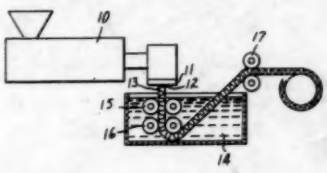
of at least about 6 inches, average widths in the range of about 0.3 to 2.0 inches, and average thickness in the range of about 0.001 to 0.005 inches, the panel having an oven dry wood density in the range of about 28–45 lbs. per cu. ft. with, an MOR to density ratio of at least about 120 and an MOE(M) to density ratio of at least about 40.

B1 4,634,485 (1372nd)

EXTRUDED ARTICLE AND METHOD OF MAKING THE SAME

Dennis G. Welygan, and Ronald O. Zemke, both of St. Paul, Minn., assignors to The Minnesota Mining & Manufacturing Co., St. Paul, Minn.

Reexamination Request No. 90/001,843, Sep. 12, 1989.
Reexamination Certificate for Patent No. 4,634,485, issued Jan. 6, 1987, Ser. No. 768,803, Aug. 23, 1985.
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—244.11



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 13 and 14 are determined to be patentable as amended.

Claims 2–12 and 15–18, dependent on an amended claim, are determined to be patentable.

1. Method of making an extruded article comprising

(1) extruding *from a first stationary extruding opening* at a first rate a first filament-forming, extrudable plastic mass to form a plurality of spaced, straight continuous parallel elements;

(2) extruding *from a second stationary extrusion opening* simultaneously, at a second rate faster than said first extrusion rate and between adjacent spaced, continuous parallel elements, a second filament-forming extrudable plastic mass to form an undulatable element which is thinner than it is wide to provide a cross-section with an aspect ratio of at least two, with the undulatable element being positioned with each opposite face of its wide dimension facing one of said continuous straight parallel elements, the surfaces of said plastic masses having a tacky first physical state which permits said surfaces to bond to one another at points of mutual contact and a second physical state in which subsequent bonding will no longer occur and in which latter state said elements have sufficient structural integrity to maintain their extruded bonded shape;

(3) while the surfaces of said elements are sufficiently tacky to simultaneously cause bonding therebetween at points of contact, causing said undulatable element to undulate in its thin dimension by permitting contact between *said undulatable elelent and* a parallel element [to form] *on one side of said undulatable element which retards the flow of the undulatable element causing it to bend toward the other adjacent parallel element thereby forming* an apex [on one side of said undulatable element] while maintaining the other adjacent parallel element in sufficiently close proximity to permit subsequent contact between it and the undulating undulatable element to form an opposed apex and to permit repetition of such undulation and subsequent contact to form a plurality of apexes, thereby providing an article having an undulated element with apexes aligned on opposed sides wherein the apexes on one side of the undulated element are bonded to one of said parallel elements and the apexes on the other side of said undulated element are bonded to the other adjacent parallel element; and

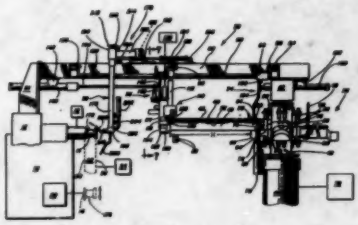
(4) changing or permitting the change of said plastic masses to said second physical state.

B1 4,793,057 (1373rd)

APPARATUS FOR MOUNTING POWER TRANSMISSION BELTS ON AND REMOVING SAME FROM PULLEYS

Yoshihiko Kamiyama, Kobe; Misso Fukuda, Miki, and Akihiro Nagata, Komaki, all of Japan, assignors to Mitsuboshi Belting Ltd., Nacata, Japan

Reexamination Request No. 90/001,961, Mar. 16, 1990.
Reexamination Certificate for Patent No. 4,793,057, issued Dec. 27, 1988, Ser. No. 27,856, Mar. 19, 1987.
Claims priority, application Japan, Jan. 16, 1987, 62-8701
Int. Cl.[5] B21D *53/10*
U.S. Cl. 29—822



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–16 is confirmed.

1. A power transmission belt transfer mechanism comprising:

push-out means for delivering power transmission belts seriatim to a pick-up position;

grasping means for grasping a portion of a belt at said pick-up position;

shuttle means for transferring the grasped belt to a release position;

release means for causing release of the grasped belt from the grasping means to a work station; and

removal means for removing the belt from the work station for permitting similar transfer of subsequent belts seriatim by said transfer mechanism.

REISSUES

OCTOBER 16, 1990

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,382

SELF-OILING PORTABLE BAG-CLOSING SEWING MACHINE WITH PUMP

Robert J. Robinson, Oak Brook, Ill., and David B. Johnson, Minneapolis, Minn., assignors to AXIA Incorporated, Oak Brook, Ill.

Original No. 4,441,442, dated Apr. 10, 1984, Ser. No. 385,921, Jun. 7, 1982. Continuation-in-part of Ser. No. 136,312, Apr. 1, 1980, Pat. No. 4,348,970. Application for reissue Apr. 8, 1986, Ser. No. 849,526

The portion of the term of this patent subsequent to Sep. 14, 1999, has been disclaimed.

Int. Cl.[5] D05B 71/00

U.S. Cl. 112—256 38 Claims

1. A self-oiling portable bag-closing sewing machine energizable from a power source, and capable of using thread to stitch a bag closed comprising:

a housing having an internal drive train chamber and said housing including a handle for carrying the machine;

first and second main drive shaft bearings, each said bearing having a central axis, each being carried by said housing, said bearings being positioned substantially coaxially, and each said bearing having an inner and an outer periphery, and an upper and a lower end;

driving means selectively connectable to the power source, carried by said housing, and including a motor and a main drive shaft rotably mounted in said first and second main drive shaft bearings for rotation about the longitudinal axis of said main drive shaft, and said main drive shaft extending within said drive train chamber and being drivingly connected with said motor to rotate said main drive shaft when the motor is energized;

a needle driving assembly including a needle having a longitudinal axis, said needle driving assembly being operatively movingly connected with said driving means to move said needle along said longitudinal axis of said needle in reciprocating movement in response to energizing of said driving means;

a feed dog assembly carried by said housing and operatively connected to said driving means to actuate said feed dog assembly for cooperation with said needle driving assembly in response to energizing of said driving means;

a presser foot unit carried by said housing and selectively bearing against said feed dog assembly and cooperating with said feed dog assembly to urge the bag against said feed dog assembly and thereby assist in moving the bag along a path past the needle;

a looper assembly carried by said housing and operatively connected with said driving means, said looper assembly cooperating with said reciprocating needle to form a stitch with the thread so as to cause the bag to be stitched closed as the bag moves along the path;

an oil reservoir capable of storing the oil and carried by said housing;

a selectively actuated pump having an inlet and outlet;

said inlet of said pump being connected in fluid flow relationship with said oil reservoir to receive oil from said reservoir; and

oil delivery means connected in fluid flow relationship with said outlet of said pump and *connected* to said housing to direct oil [into said drive train chamber and into] *to* at least one of said main bearings [to lubricate said bearing and to cause excess oil discharge from said bearing and onto said main drive shaft for dispersion of the oil by outward flinging from said drive shaft] *and* onto at least one of said assemblies [during rotation of said driveshaft].

14. A portable sewing machine for closing bags comprising:

a housing having an internal chamber;

a driving assembly at least part of which is contained within said housing and including a drive shaft;

bearing means for rotatably retaining the drive shaft within said housing;

a reservoir for storing oil;

a selectively actuated hand pump coupled to said reservoir; and

oil delivery means coupled to said hand pump for directing oil pumped from said hand pump to the internal chamber of said housing.

18. A portable hand-held sewing machine for closing bags comprising:

a housing having an internal chamber;

a driving assembly at least part of which is contained within said housing;

bearing means for rotatably retaining at least a portion of the driving assembly within said housing;

a single external oil reservoir attached to said housing for securely storing more than a temporary supply of oil;

oil distribution means for directing oil from said reservoir to the internal chamber of said housing to lubricate the driving assembly during operation of the sewing machine.

31. A self-oiling portable bag-closing sewing machine energizable from a power source, and capable of using thread to stitch a bag closed comprising:

a housing having an internal drive train chamber and said housing including a handle for carrying the machine;

first and second main drive shaft bearings, each said bearing having a central axis, each being carried by said housing, said bearings being positioned substantially coaxially, and each said bearing having an inner and an outer periphery, and an upper and a lower end;

driving means selectively connectable to the power source, carried by said housing, and including a motor and a main drive shaft rotatably mounted in said first and second main drive shaft bearings for rotation about the longitudinal axis of said main drive shaft, and said main drive shaft extending within said drive train chamber and being drivingly connected with said motor to rotate said main drive shaft when the motor is energized;

a needle driving assembly including a needle having a longitudinal axis, said needle driving assembly being operatively movingly connected with said driving means to move said needle along said longitudinal axis of said needle in reciprocating movement in response to energizing of said driving means;

a feed dog assembly carried by said housing and operatively connected to said driving means to actuate said feed dog assembly for cooperation with said needle driving assembly in response to energizing of said driving means;

a presser foot unit carried by said housing and selectively bearing against said feed dog assembly and cooperating with said feed dog assembly to urge the bag against said feed dog assembly and thereby assist in moving the bag along a path past the needle;

a looper assembly carried by said housing and operatively connected with said driving means, said looper assembly cooperating with said reciprocating needle to form a stitch with the thread so as to cause the bag to be stitched closed as the bag moves along the path;

a single external oil reservoir capable of securely storing and retaining more than a temporary supply of oil, said oil reservoir being carried by said housing; and

oil delivery means connected in fluid flow relation with said oil reservoir and with said housing to direct oil to said drive train chamber and onto at least one of said assemblies for dispersion within said drive train chamber by outward flinging of such oil within said chamber by at least one of said assemblies during operation of the sewing machine.

Re. 33,383

PROCESS FOR PRODUCING A MAGNETIC READ WRITE HEAD AND HEAD OBTAINED BY THIS PROCESS

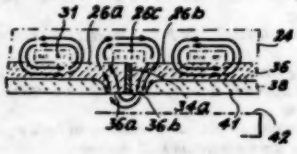
Jean-Pierre Lazzari, Corenc, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Original No. 4,639,289, dated Jan. 27, 1987, Ser. No. 696,517, Jan. 30, 1985. Application for reissue Jan. 24, 1989, Ser. No. 300,974

Claims priority, application France, Feb. 3, 1984, 84 01879

Int. Cl.[5] G11B *5/127, 5/17, 5/187;* B44C *1/22*

U.S. Cl. 156—643 **4 Claims**



1. A process for producing a magnetic read-write head, comprising the steps of: depositing a first magnetic material film on a support, etching a groove in said first magnetic film, said groove being shaped like a figure eight with two loops having in common a rectilinear central portion, the magnetic film being preserved within said two loops and forms there two central pole pieces separated by a central channel corresponding to the central portion of the figure eight, filling the groove with an electrically insulating material, etching in the insulating material a notch forming a double groove wound respectively around the two central pole pieces, depositing a conductive coating at the bottom of the double groove and then filling the double groove with a first electrically insulating material, depositing a second insulating material layer on the two central pole pieces and on the first electrically insulating material, etching in said layer a step having a side substantially perpendicular to the surface of the central portion of the figure eight but which is slightly off-center with respect thereto, depositing an amagnetic material film on the thus etched step, anisotropic etching said amagnetic film so as to only leave a wall of said amagnetic film perpendicular to the plane of the films and constituted by that part of the amagnetic film depositing on the side of the step, depositing a second magnetic material film forming a boss covering the wall, depositing a protective coating on said second magnetic material film and covering the boss and cutting the protective coating of the second magnetic material film and the amagnetic wall, along a common horizontal plane substantially parallel to said first magnetic film, pole pieces are separated by an [air] *amagnetic* gap.

Re. 33,384

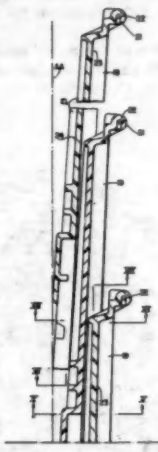
NESTING BOX WITH REDUCED LID FLARES

Daniel R. Miller, Cincinnati, and Thomas P. Deaton, Mason, both of Ohio, assignors to Buckhorn, Inc., Milford, Ohio

Original No. 4,688,675, dated Aug. 25, 1987, Ser. No. 706,318, Feb. 27, 1985. Application for reissue Aug. 25, 1989, Ser. No. 398,774

Int. Cl.[5] B65D *21/02, 21/06*

U.S. Cl. 206—508 **55 Claims**



14. A molded plastic tote box, comprising:

a container having a rectangular bottom, and two pair of opposed side and end walls serially connected to each other around the periphery of said bottom to extend upwardly and outwardly so that a plurality of like containers may be nested therein and so that the nested height of any two containers is less than the height of two containers;

a lid overlapping the top periphery of said container in a closed position to at least partially close the top of said container;

hinge means for said lid hingedly connecting said lid to one of said opposed end walls respectively so that said lid may be rotated from the closed position approximately 270 degrees to an open position in which said lid has a shingled orientation and contact with respect to lids of adjacent nested tote boxes;

said lid having a generally planar body portion than is horizontal in the closed position;

said lid having a peripheral flange structure including an inboard flange portion extending upwardly from the side edge of said body portion along the inside of said container side walls to an upper edge in the closed position, a horizontal flange portion extending outwardly from said upper edge and overlapping the top edge of said container side walls in the closed position of the lid, and an outboard flange portion extending downwardly from the outer edge of said horizontal flange to overlap said container side walls in the closed position; and

said flange structure further having reduced projecting structure in the area of the contact including said outboard flange portion having a variation in depth as measured generally perpendicular to said body portion that generally decreases in depth in the area of the contact where it is most closely adjacent the flange structure of the adjacent shingled lid of the next higher nested box for reducing interference therebetween, and including said inboard flange having reduced interfering structure adjacent said side edge in the area of

said contact, so that the interfering flange structure generally decreases so that the lid flare of the shingle lid is substantially less than it would be if the projecting structure did not decrease.

Re. 33,385

AIRCRAFT

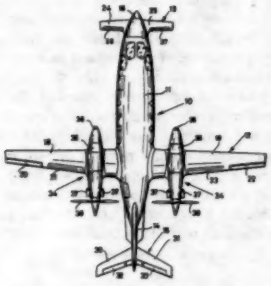
Alessandro Mazzoni, Garlenda, Italy, assignor to Industrie Aeronautiche e Rinaldo Piaggio S.p.A., Genoa, Italy

Original No. 4,746,081, dated May 24, 1988, Ser. No. 382,664, May 27, 1982. Application for reissue Nov. 22, 1988, Ser. No. 275,095

Claims priority, application Italy, Jan. 25, 1982, 19275 A/82

Int. Cl.[5] B64L *5/02*

U.S. Cl. 244—89 **1 Claim**



1. A three-lift surface aircraft characterized in that it comprises, in combination:

a fuselage having a minimum aerodynamic resistance and the external outline of which is [absolutely] devoid of any curvature discontinuities,

a main wing forming a main lift surface equipped with wing flaps and ailerons, placed across said fuselage [at a level] about midway thereof,

a front tab forming a front lift surface, rigidly connected to the front end of said fuselage and having an area less than one third of the area of said main wing, composed of two symmetrical half-tabs relative to the centre line of the aircraft and rigidly connected together [so as to form a negative dihedron] and positioned beneath the plane of said main wing and being equipped with wing flaps,

a vertical tail plane, equipped with a rudder, installed behind said main wing,

a horizontal tail plane forming a rear lift surface having an area less than one third of the area of said main wing, consisting of two half-planes which are symmetrical relative to the centre line of the aircraft and are connected rigidly together [so as to form a negative dihedron], mounted in elevation on said vertical tail plane, and being equipped with elevators,

two [turbopropeller engines which drive propellers] *propelling means* [positioned behind said main wing,] installed on said wing in a position symmetrical relative to the middle plane of the aircraft,

a passenger compartment placed in said fuselage ahead of said main wing,

a front landing gear which can fully be retracted within the fuselage, and

two main rear landing gears which can completely be retracted within said fuselage behind the passenger compartment thereof.

Re. 33,386

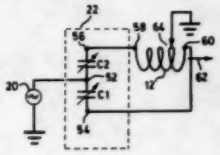
METHOD AND APPARATUS FOR SAMPLING A PLASMA INTO A VACUUM CHAMBER

Donald J. Douglas, 157 Wychwood Ave., Apt. 3, Toronto, Ontario M6C 2T1, Canada

Original No. 4,501,965, dated Feb. 26, 1985, Ser. No. 458,009, Jan. 14, 1983. Application for reissue Aug. 7, 1987, Ser. No. 84,670

Int. Cl.[5] H01J *49/04, 49/26*

U.S. Cl. 250—288 **25 Claims**



1. Apparatus for sampling a plasma into a vacuum chamber comprising:

(a) means for generating a plasma, including an electrical induction coil having first and second terminals and at least one turn between said first and second terminals, said turn defining a space within said coil for generation of said plasma, *and means for supplying an alternating electrical current to said coil to excite said plasma,*

(b) a vacuum chamber including an orifice plate defining a wall of said vacuum chamber,

(c) said orifice plate having an orifice therein located adjacent said space for sampling a portion of said plasma through said orifice into said vacuum chamber,

(d) the electrical current in said coil constituting the sole electrical power means for generating said plasma,

[(d)] *(e)* and circuit means connected to said coil between said terminals to reduce the peak to peak voltage swing in said plasma*thus to reduce the likelihood of electrical arcing from said plasma.*

Re. 33,387

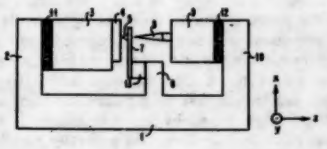
ATOMIC FORCE MICROSCOPE AND METHOD FOR IMAGING SURFACES WITH ATOMIC RESOLUTION

Gerd K. Binnig, Inning, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Original No. 4,724,318, dated Feb. 9, 1988, Ser. No. 892,977, Aug. 4, 1986. Continuation-in-part of Ser. No. 802,123, Nov. 26, 1985, abandoned. Application for reissue Nov. 16, 1988, Ser. No. 273,354

Int. Cl.[5] H01J *37/26*; G01N *23/00*

U.S. Cl. 250—306 **31 Claims**



18. A method for examining a surface of a sample, comprising the following steps:

providing relative motion in a z direction between a point on a deflectable cantilever of an atomic force microscope and a surface of said sample to be inspected, said point and said surface being brought sufficiently close that the interatomic force between atoms at the apex of said point and at a first area on said sample surface cause a deflection of said cantilever;

detecting and using the deflection of said cantilever to produce a signal indicative of a property of said area of said sample;

producing relative lateral motion between said sample and said point to scan said point with respect to said sample surface; and

detecting and using the deflection of said cantilever when it is scanned across said sample surface to produce further signals indicative of a property of other areas of said sample surface, thereby examining said surface.

Re. 33,388

TOE PIECE FOR A SAFETY SKI-BINDING

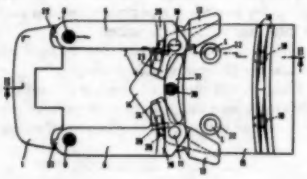
Gerhard Sedlmair, Farchant, and Walter Knabel, Murnau, both of Fed. Rep. of Germany, assignors to Marker Deutschland GmbH, Eschenlohe, Fed. Rep. of Germany

Original No. 4,660,849, dated Apr. 28, 1987, Ser. No. 783,926, Jan. 23, 1985. Application for reissue Jul. 29, 1988, Ser. No. 226,053

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1984, 3403472

Int. Cl.[5] A63C *9/08*

U.S. Cl. 280—625 **25 Claims**



1. A toe piece for a safety ski binding, said toe piece having a rearward portion, a longitudinal axis and longitudinally extending side portions, and comprising:

base means;

soleholder means pivotally mounted [in fixed relation with] *on* said base means and biassed to a central, rearwardly facing direction for engaging and retaining a ski boot sole in the binding, said soleholder means pivoting to release a retained ski boot when a sidewise force applied to the ski boot exceeds a predetermined value;

lower support means mounted on said base means;

pedal means for engaging the sole portion of a ski boot in said toe piece, said pedal means being pivotally mounted for movement with said soleholder means in response to the movement of the ski boot retained in the toe piece; said pedal means being disposed over said lower support means and having first ramp means including a series of resilient ramps joined by juncture means; said juncture means extending in directions generally parallel to said side portions and located for engagement by said lower support means when a downward force is exerted on said pedal means in the absence of sidewise forces, said first ramp means including ramps inclined from said juncture means towards opposite sides of said toe piece for engagement by said lower support means when said pedal means is subjected to downward and sidewise forces, the ramps configured for engagement by said lower support means for establishing forces offsetting the sidewise forces resulting from friction between [the ski boot] *said ramp means* and the binding] *said lower support means.*

Re. 33,389

ADJUSTABLE ENDLESS BELT

Paul Beck, P.O. Box 2426, Malibu, Calif. 90265

Original No. 4,637,810, dated Jan. 20, 1987, Ser. No. 588,733, Mar. 12, 1984. Application for reissue Jan. 23, 1989, Ser. No. 300,320

Int. Cl.[5] F16G *3/00*

U.S. Cl. 474—253 **10 Claims**

1. A continuously adjustable endless belt for use in power transmission comprising an outer length of flexible tear-resistant material, a cylindrical channel of constant radius extending [logitudinally] *longitudinally* through said outer length of material, [at least one length of reinforcing material disposed in said outer length of material and extending the length thereof,] a cylindrical cord of constant radius constructed of flexible tear-resistant material slidably disposed within said channel, [a length of reinforcing material disposed in said cord and extending the length thereof, the length of said cord being equal to the length of said outer length of flexible material] such that upon pulling a portion of said cord from one end of said outer length of material, applying an adhesive material to said portion of said cord and disposing said portion within said channel in the other end of said outer length of material, a continuous belt of uniform construction is defined.

Re. 33,390

MOTOR DEVICE UTILIZING ULTRASONIC OSCILLATION

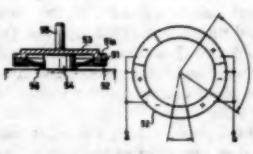
Toshiiku Sashida, 1-8, Kasuya 2-chome, Setagaya-ku, Tokyo 157, Japan

Original No. 4,562,374, dated Dec. 31, 1985, Ser. No. 610,933, May 16, 1984. Continuation of Ser. No. 469,245, Feb. 24, 1983, abandoned. Application for reissue Dec. 18, 1987, Ser. No. 135,187

Claims priority, application Japan, Feb. 25, 1982, 57-29400; Nov. 22, 1982, 57-205220; Dec. 26, 1982, 57-228569

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—328 **29 Claims**



1. A motor device utilizing ultrasonic oscillation comprising:

an elastic body;

a piezoelectric [member] , *electrostriction or magnetostriction ultrasonic oscillator* comprising a plurality of piezoelectric, *electrostriction or magnetostriction* elements [in contact with] *secured to* said elastic body;

electrodes formed on said [piezoelectric] elements;

said [piezoelectric] elements being arranged *at least* in first and second groups *having different phases*, each *group* consisting of a plurality of elements the electrodes of which [groups] are connected, respectively, to first and second sources of [alternating current] *high frequency voltage*, the phase of the [alternating current] *voltage* of said second source being [displaced ninety degrees] *out of phase* with respect to the phase of the [alternating

current] *voltage* of said first source whereby said [piezoelectric] elements are driven by said [alternating currents] *high frequency voltages* applied to said electrodes to cause oscillation in said elastic body which [produce] *produces* a [Rayleigh] *progressive* wave *constituted by a longitudinal wave and a transverse wave* at a surface of said elastic body;

a movable body having a mating surface in contact with said surface of said elastic body; and

means for pressing said mating surface in forced contact with said elastic body surface whereby said [Rayleigh] *progressive* wave acts upon said mating movable body surfaace to cause a unidirectional motion of said movable body with respect to said elastic body.

Re. 33,391

PROCESS FOR IMAGING BY NUCLEAR MAGNETIC RESONANCE

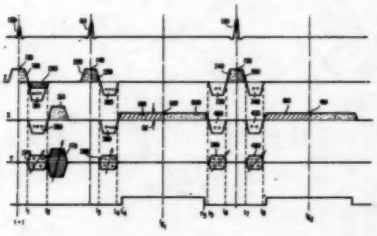
Eric Breton, Voisins le Bretenneux, France; Denis Le Bihan, Rockville, Md., and Patrick Le Roux, Gif sur Yvette, France, assignors to Thomson-CGR, Paris, France

Original No. 4,780,674, dated Oct. 25, 1988, Ser. No. 946,034, Dec. 24, 1986. Continuation-in-part of Ser. No. 823,522, Jan. 29, 1986, abandoned. Application for reissue Jan. 26, 1989, Ser. No. 301,991

Claims priority, application France, Jun. 27, 1985, 85 09824; Aug. 13, 1985, 85 12352; European Pat. Off., Jun. 27, 1986, 86 4014238

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **24 Claims**



1. A process for imaging by nuclear magnetic resonance, wherein it comprises the following stages for giving an image of the molecular diffusion of an investigated body:

the body is placed in a constant magnetic field B_O;

the thus positioned body is subject to a first plurality of first spin echo excitation sequences in the presence of first field gradient sequences, said first spin echo sequences having an integral number N equal to or greater than one excitations where the magnetic moments of the nuclei of the body are flipped by 180° following an excitation in which said moments have been flipped by 90° to obtain in this way sequences with N slightly diffusing echoes;

the magnetic resonace signals are recorded at the end of these first sequences and a first image is calculated corresponding to echo N of these signals by allocating to each point of the image a value corresponding to the magnetic resonance signal of the point corresponding thereto in the body;

the thus positioned body is subject to a second plurality of second spin echo excitation sequences in the presence of second field gradient sequences, said second spin echo sequences having at least one 180° excitation following a 90° excitation for forming diffusing sequences with at least one echo, the total echo durations of the second excitation sequences being equal to the total echo durations of the first excitation sequences;

the magnetic resonance signals are recorded at the end of said second excitation sequences and a second image is calculated corresponding to the echoes of these signals by allocating to each image point a value corresponding to the magnetic resonance signal of the point corresponding thereto in the body;

there is a point-by-point comparison of the values allocated for the first image with the values allocated for the second image, in order to produce a third image representing the molecular diffusion at each point of the body.

Re. 33,392

PROCESS FOR USING RICINOLEATE PLASTICIZED POLYURETHANES FOR SEALING ELECTRICAL DEVICES

Melvin Brauer, East Brunswick; William J. Downey, Linden, and Frank C. Naughton, Mountainside, all of N.J., assignors to CasChem, Inc., Bayonne, N.J.

Original No. 4,705,723, dated Nov. 10, 1987, Ser. No. 945,986, Dec. 24, 1986. Division of Ser. No. 837,555, Mar. 3, 1986, Pat. No. 4,666,969, which is a continuation-in-part of Ser. No. 713,379, Mar. 19, 1985, abandoned. Application for reissue Oct. 30, 1989, Ser. No. 428,684

The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.

Int. Cl.[5] B32B *27/04, 27/06, 27/22, 27/40*

U.S. Cl. 428—375 **22 Claims**

1. A process for providing a fluid impervious protective seal around an insulated electrical device which comprises introducing the components of the polyurethane gel composition comprising about 10 to 90 parts by weight of the liquid reaction product of an organic polyisocyanate and a polyol in the presence of about 90 to 10 parts by weight of a ricinoleate plasticizer compound having a total solubility parameter of [between about 8.3 and 8.9 or] between about 9.1 and [9.7] *10.1* into a confined space surrounding the section of a device to be protected and allowing said composition to cure to a gel.

Re. 33,393

SELECTIVE REMOVAL OF HYDROGEN SULFIDE OVER ZINC TITANATE AND ALUMINA

Dennis R. Kidd, Dewey, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Original No. 4,725,415, dated Feb. 16, 1988, Ser. No. 869,766, Jun. 2, 1986. Application for reissue Feb. 13, 1990, Ser. No. 479,314

Int. Cl.[5] C01B *17/16, 31/20*

U.S. Cl. 423—230 **27 Claims**

1. A process for removing hydrogen sulfide from a fluid stream containing hydrogen sulfide comprising the step of contacting said fluid stream under absorbing conditions with an absorbing composition comprising zinc titanate and alumina promoted with at least one metal selected from tungsten and molybdenum and at least one metal selected from Group VIII of the Periodic Table, wherein the concentration of alumina in said absorbing composition is in the range of about 10 weight-% to about 55 weight-% based upon the combined weight of the zinc titanate and alumina.

19. A process in accordance with claim 1 wherein said absorbing conditions comprise a temperature in the range of about [149] *150°* C. to about [538] *650°* C., a total system pressure in the range of about atmospheric to about 2000 psig and a residence time for said fluid stream in the presence of said absorbing composition in the range of about [0.1] *10* to about [50 liquid] *10000* volumes of said fluid stream per volume of said absorbing composition per hour.

PLANT PATENTS

GRANTED OCTOBER 16, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,354

ROSE PLANT INTERMOTTO

Peter Ilsink, Leersum, Netherlands, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Mar. 10, 1989, Ser. No. 321,908
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—28 1 Claim

1. A new and distinct variety of rose plant of the Floribunda class substantially as herein shown and described, characterized particularly as to novelty by the unique combination of vigorous growth, disease resistant foliage, high production of cut flowers suitable as sprays, and long vase life.

7,355

PLUM CV. SUPLUMSEVENTEEN

John H. Weinberger, and Timothy P. Sheehan, both of Fresno, Calif., assignors to Superior Farming Company, Bakersfield, Calif.

Division of Ser. No. 131,178, Dec. 10, 1987, abandoned. This application Sep. 18, 1989, Ser. No. 408,642
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—38 1 Claim

1. A new variety of plum tree cv. Suplumseventeen particularly distinguished and characterized by its early-ripening, fresh quality black plum fruit of very large size; is round, slightly oblate fruit shape; its lenticels more prominent on the fruit's blossom end and its dark purple-black exterior fruit skin color at full maturity, substantially as herein shown and described.

7,356

GERANIUM PLANT NAMED 'DUEGE'

Guenter Duemmen, Dammweg 18-20, D-4134 Rheinberg 4, Fed. Rep. of Germany

Filed May 20, 1988, Ser. No. 196,282
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Geranium known as Duege, as described and illustrated, and particularly characterized by a new color, a great number of umbels, a semi-double flower form, and very early flowering.

7,357

DAYLILY PLANT NAMED 'COLONEL SCARBOROUGH'

David Kirchoff, Sanford, Fla., assignor to Jon Rackley, Eustis, Fla.

Filed Aug. 8, 1989, Ser. No. 390,894
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. The new plant variety of the Lily family substantially as shown and described herein.

7,358

VARIETY OF GERANIUM NAMED NICOLE

Jacques Guillou; Bernard Guillou, and Maurice Guillou, all of Saint-Malo, France, assignors to Etablissement Guillou Freres Jacques, Bernard et Maurice, France

Filed May 31, 1989, Ser. No. 359,734
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety of Ivy Geranium plant as shown and described herein, and characterized by less tendency to burn or shatter, smaller darker leaves, earlier bloom, a superior compact plant habit, a clean pink bloom color, a dark green leaf zone and better heat tolerance as compared with Galilee.

7,359

GERANIUM PLANT NAMED 'DUELYR'

Guenter Duemmen, Dammweg 18-20, D-4134 Rheinberg 4, Fed. Rep. of Germany

Filed May 20, 1988, Ser. No. 196,281
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Geranium known as Duelyr, as described and illustrated, and particularly characterized by a purple color, many inflorescences and double flowers, slight zonation, compact growth, and very early flowering.

7,360

VARIETY OF GERANIUM NAMED NANETTE

Jacques Guillou; Bernard Guillou, and Maurice Guillou, all of Saint-Malo, France, assignors to Etablissement Guillou Freres Jacques, Bernard et Maurice, France

Filed May 31, 1989, Ser. No. 359,170
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety of Ivy Geranium plant as shown and described herein, and characterized by a new color to the Ivy Geranium class, a "Geranium" red color which accents the medium green foliage, and a variety which is also much hardier in higher temperatures than those Ivy Geraniums currently on the market.

PATENTS

GRANTED OCT. 16, 1990

ERRATA

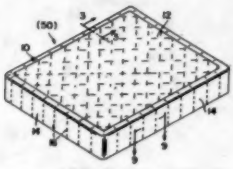
For CLASS	See PATENT NO.
005-497	4,962,546
123-399	4,962,570
361-134	4,962,596
049-374	4,962,601
052-506	4,962,612
057-105	4,962,633
053-234	4,962,634
076-058	4,962,651
102-206	4,962,706
244-137	4,962,798
175-258	4,962,822
222-209	4,962,851
228-193	4,962,876
251-149	4,962,881
285-055	4,962,958
303-116	4,962,975
244-105	4,962,978
071-094	4,963,173
199-036	4,963,203
423-235	4,963,332
435-007	4,963,468
435-007	4,963,469
048-210	4,963,513
524-305	4,963,594
525-415	4,963,595
526-313	4,963,596
524-604	4,963,652
060-578	4,963,692
341-131	4,963,881
342-044	4,963,887
342-090	4,963,888
342-357	4,963,889
342-359	4,963,890
455-307	4,963,945
368-282	4,964,092
369-059	4,964,094
370-055	4,964,095
370-016	4,964,105
373-094	4,964,114
374-109	4,964,115
375-011	4,964,116
375-108	4,964,117
357-015	4,964,144

PATENTS

GRANTED OCTOBER 16, 1990

GENERAL AND MECHANICAL

4,962,546
MATTRESS PAD WITH STRETCH-WALL CONSTRUCTION
Joseph Vitale, Ft. Lauderdale, Fla., assignor to Perfect Fit Industries, Inc., Monroe, N.C.
Filed Jul. 20, 1989, Ser. No. 383,387
Int. Cl.[5] A47G *9/02*
U.S. Cl. 5—497 **4 Claims**

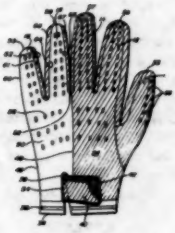


4. A mattress cover adapted to conformingly fit over a mattress, comprising:

a non-elastic top panel having a general shape similar to that of the top surface of the mattress, defining edges and corners; and

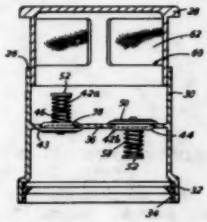
a plurality of side panels attached to the edges of the top panel, adjacent side panels being attached to each other at the corners of the top panel, the side panels including a layer of woven bedding fabric, a layer of backing material, and a layer of non-woven elastic material therebetween, the layers being joined together by a network of sewn seams, the fabric layer and backing layer being bunched between the seams whereby the side panels are stretchable primarily in one direction.

4,962,547
GOLF GLOVE
Jim Minnick, 9149 Meadowview Rd., Bloomington, Minn. 55425
Filed Jun. 21, 1989, Ser. No. 369,515
Int. Cl.[5] A41D *19/00*
U.S. Cl. 2—161 A **9 Claims**



1. As a new article of manufacture: a golf glove for the hand of a user placed highest on the shaft of a golf club, said glove comprising backside panel areas of material forming the backside of the glove, said backside panel areas including a grip indicator panel area defined as the area covering the backside of the user's little and ring fingers down to the tip thereof and also covering the portion of the backside of the body of the user's hand between the outside edge thereof and a line substantially parallel to said outside edge intersecting the juncture between the user's ring and middle fingers, said indicator panel area being visually distinct form all other material of the backside panel areas of the glove such that a user gripping the shaft of a golf club while addressing a golf ball may employ said indicator panel area to determine orientation of grip by noting his or her ability or inability to visually observe any significant portion of said indicator panel area.

4,962,548
VALVE ASSEMBLY
Ivor G. van Deventer, and Gerrit R. C. di Somma, both of Midrand, South Africa, assignors to G.I. Marketing CC, Midrand, South Africa
Filed Sep. 7, 1988, Ser. No. 241,243
Claims priority, application South Africa, Sep. 7, 1987, 87/6659; Nov. 13, 1987, 87/8520
Int. Cl.[5] E03F *5/08*
U.S. Cl. 4—211 **8 Claims**



1. A plumbing arrangement comprising:

a toilet pan incorporating a water trap,

a waste disposal pipe connected to the pan,

a waste pipe extension extending above the water trap, the waste pipe extending only a short height above the pan, and

normally closed two-way valve means openable in both flow directions at different times to vent the waste pipe extension to atmosphere and to permit air to enter the waste pipe extension from the atmosphere,

wherein the valve means comprises two one-way valves disposed to operate in opposite flow directions.

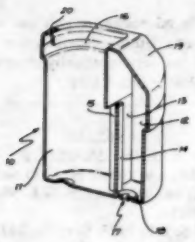
4,962,549
IN-TANK DISPENSING DEVICE FOR DOSING A TOILET BOWL
Stephen King, Sylvania Heights, Australia, assignor to R & C Products Pty. Limited, Ermington, Australia
Filed May 5, 1989, Ser. No. 347,988
Claims priority, application Australia, May 5, 1988, 15611/88
Int. Cl.[5] E03D *9/03*
U.S. Cl. 4—228 **10 Claims**

1. A passive dispenser for mounting in a cistern for use in dosing a toilet bowl with an additive, said dispenser comprising:

A container having a first chamber and a second chamber formed therein in side-by-side relation with respect to a common base and separated by a common wall extending upwardly from said base, said common wall having an opening therein to permit fluid communication between said chambers, said opening being formed by a portion of said common wall being offset with respect to the remainder of said common wall, said portion extending upwardly from said base and terminating in an upper edge spaced from the remainder of said common wall to define said opening;

the first chamber being adapted to hold the additive; and

the second chamber having a filling means to admit water thereinto during filling of the cistern and discharge means



to discharge additive-containing water into the toilet bowl when the toilet is flushed.

4,962,550

TOILET WITH URINE CONSTITUENT MEASURING DEVICE

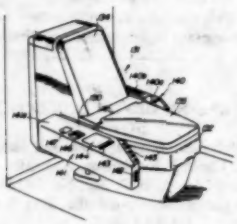
Takao Ikenaga; Toshifumi Shigematsu, both of Kanagawa; Masatoshi Yada, Fukuoka; Shigeru Makita, and Hitoshi Kitaura, both of Kyoto, all of Japan, assignors to Toto, Ltd., Fukuoka and Omron Tateisi Electronics Co., Kyoto, both of, Japan

Filed Aug. 24, 1988, Ser. No. 235,504

Claims priority, application Japan, Aug. 24, 1987, 62-209966; Aug. 24, 1987, 62-209967; Aug. 24, 1987, 62-209968; Aug. 24, 1987, 62-209969; Aug. 24, 1987, 62-209970; Aug. 24, 1987, 62-209971; Aug. 24, 1987, 62-209972; Aug. 24, 1987, 62-128246; Aug. 24, 1987, 62-128247

Int. Cl.[5] E03D *11/00*; A61B *5/00*

U.S. Cl. 4—420 **25 Claims**



1. A toilet comprising:

a bowl surface including a urine receiving surface;

a urine reservoir having a surface contiguous to said bowl surface and said urine receiving surface; and

a measuring device for measuring constituents of urine sampled from said urine reservoir, wherein said measuring device comprises measuring means for measuring said constituents of urine from a test sample on a piece of test paper, said measuring means supported by said toilet and having a slot adapted for receiving therein a piece of test paper including said test sample, said measuring means further including a urine sensor means for sensing said constituents of urine contained in said test sample included in said test paper.

4,962,551

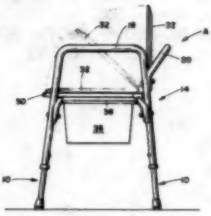
PORTABLE COMMODE

Robert R. Bly, Wellington, Ohio, assignor to Invacare Corporation, Elyria, Ohio

Filed Mar. 20, 1989, Ser. No. 326,229

Int. Cl.[5] A47K *11/02*, *13/12*

U.S. Cl. 4—480 **13 Claims**



1. A portable commode comprising:

a front pair of legs and a rear pair of legs;

a front horizontal cross bar connecting said front pair of legs;

a rear horizontal cross bar connecting said rear pair of legs, the rear cross bar being at least partially cylindrical;

a frame supported by the legs; the frame defining a chair-like configuration;

a container;

a pair of elongated support members connecting said front and rear cross bar members for supporting said container therebetween;

a seat pivotally received on the rear partially cylindrical cross bar member and supported by the front cross bar member, the seat including at least one integrally molded seat clamp projecting from a rear portion thereof, the seat clamp having a groove defining an arc situated away from a bottom plane of the commode seat and configured for pivotal movement about the rear cross bar member, said seat groove having an inner dimension slightly smaller than the diameter of the rear partially cylindrical cross bar member to provide for locking, rigid receipt of the seat clamp on the rear partially cylindrical cross bar member; and,

a lid pivotally received on the rear partially cylindrical cross bar member adjacent the seat for movement from a closed position on the seat to an open position away from the seat, said lid having at least one integrally molded lid clamp projecting from a rear portion thereof, the lid clamp having a groove defining an arc situated away from a bottom plane of the lid and configured for receipt on and pivotal movement about the rear partially cylindrical cross bar member, said lid groove having an inner dimension slightly smaller than the diameter of the rear partially cylindrical cross bar member to provide for locking, rigid receipt of the lid clamp on the rear partially cylindrical cross bar member.

4,962,552

AIR-OPERATED BODY SUPPORT DEVICE

Charles E. Hasty, Box 185, Carrollton, Tex. 75006

Filed May 9, 1988, Ser. No. 192,583

Int. Cl.[5] A61G *7/057*

U.S. Cl. 5—453 **23 Claims**

1. A body support device adapted to placement on a bed frame, comprising:

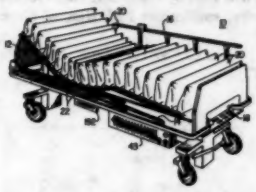
(a) a plurality of parallel air sacks, each extending substantially the width of the frame to form a support surface for a person, the material forming the sacks being substantially impervious to the passage of air and other fluids, each having only one inlet located at one end thereof;

(b) air flow production means connected to provide pressurized air to all of said inlets, whereby each sack, in coopera-

tion with the air flow production means, forms a support pressure system for the part of the person's body supported by the sack;

(c) means for selecting and establishing the pressures maintained in the sacks;

(d) valve means operable between at least three states: a first state wherein the sack inlets communicate with the outlet of the air flow production means, a second state in which



the sacks inlets communicate with atmosphere so as to expel the air contained in the sacks, and a third state in which the sack inlets are closed to air flow to retain air pressure in the sacks whereby the bed may be moved while maintaining air support of the person lying thereon; and

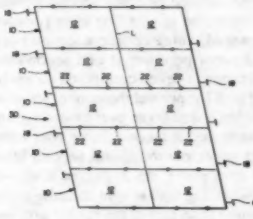
(e) a single mode selector for user control of the valve means comprising a mechanical switch manually operable to move the valve means between the said three states.

4,962,553

INFLATABLE MATTRESS STRUCTURE

Charles E. Marquis, #228 3400 Chateau Blvd., Kenner, La. 70065

Filed Apr. 19, 1989, Ser. No. 340,203
Int. Cl.[5] A47C *27/10*
U.S. Cl. 5—455 **1 Claim**



1. An inflatable mattress structure for use on an invalid bed or the like, the mattress structure having a length dimension and a width dimension, which comprises:

a plurality of pairs of separately inflatable air cushions defining respective pairs of separately inflatable air cushion mattress portions, each of the air cushions including an essentially flat manifold having a smooth bottom, a separate inflation valve and a grid-like array of intersecting rows of separate, simultaneously inflatable bulbs extending upwardly from the manifold, with each intersecting row including a plurality of the separate, simultaneously inflatable bulbs;

each singular cushion of the pair of cushions which makes up each pair of the separately inflatable air cushion mattress portions having an edge portion permanently bonded by an adhesive to an adjacent edge portion of the corresponding singular cushion which makes up the pair, the pair of air cushion mattress portions defining a removable and replaceable mattress section having a dimension which corresponds to and defines the width of the inflatable mattress structure; and

cooperable snap-type fastener means on other transversely extending edge portions of each of the singular cushions of the pair of cushions which makes up each of the pairs of inflatable air cushion mattress portions, for interconnecting the mattress sections defined by the pairs of air cushion mattress portions together to define the length of the mattress structure, the snap-type fastener means and the smooth bottoms of the air cushions combining to facilitate selective separation of at least one of the mattress sections from the remainder of the mattress structure, removal of the separated mattress section from beneath a patient on the mattress structure, subsequent replacement of the removed mattress section beneath the patient, and reconnection of the replaced mattress section to the remainder of the mattress structure, the pairs of air cushion mattress portions also essentially defining respective opposite halves of the mattress structure so that the patient on the mattress structure can be selectively positioned on one half or the other half of the mattress structure by selective inflation and deflation of the air cushion mattress portions.

4,962,554

QUILTED BED COVER

Günter Tesch, Avenue Jean-Marie-Musy 15, Fribourg, Switzerland CH-1700

Filed Mar. 14, 1989, Ser. No. 322,995
Claims priority, application Switzerland, Mar. 28, 1988, 01129/88
Int. Cl.[5] A47G *9/00*
U.S. Cl. 5—502 **10 Claims**

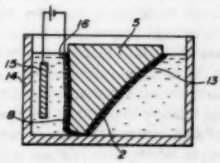
1. A quilted cover comprising two outer sheets and a filling between the two sheets, wherein a plurality of fiber aggregates of spherically tangled fibers is located at quilting areas, and wherein the two outer sheets of the cover are connected by quilting through the fiber aggregates wherein quilting threads are sewn loosely under a slight tension and penetrate the two outer sheets and the fiber aggregates in the quilting areas, such that the two outer sheets are spaced apart from one another in the quilting areas.

4,962,555

PLASTIC HEELS OF SHOES AND BOOTS

Keizi Nakamura, 78, Toyama-cho, Nijusseikigaoka, Matsudo-shi, Chiba-ken, Japan

Division of Ser. No. 241,857, Sep. 8, 1988, abandoned. This application Jun. 13, 1989, Ser. No. 365,497
Int. Cl.[5] A43B *21/20*
U.S. Cl. 12—147 R **10 Claims**



1. A method for producing a plastic heel for shoes or boots in which the heel has a surface with an irregular figure, said

irregular figure being a copy of leather or leather-like material, the method comprising the steps of:

covering a master model formed in a predetermined heel shape with leather or leather-like material, the leather or leather-like material having a surface with the irregular figure;

depositing electroconductive material on the surface of the covered master model and thereafter subjecting the master model to electroforming treatment to form a mold having an inner surface with the reverse of the irregular figure of the leather or leather-like material; and

molding the heel from plastic material to have a surface with the irregular figure of the leather or leather-like material copied from the mold.

4,962,556

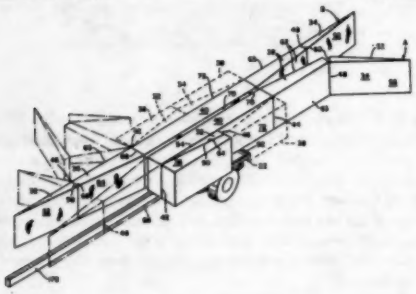
LIGHTWEIGHT, COLLAPSIBLE BRIDGE MODULE, AND SYSTEM WITH DEPLOYMENT AND RETRIEVAL TRAILER

Richard W. Helmke, Stafford; David C. Smith, Alexandria, and Mark P. Levine, Woodbridge, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 2, 1989, Ser. No. 318,213

Int. Cl.[5] E01D *15/12*

U.S. Cl. 14—2.4 **16 Claims**



1. A collapsible, lightweight, low profile modular bridge assembly comprising modular components collectively forming a pair of foldable side-by-side vehicle-wheel-receivable spans each having a collectively formed vehicle-traversable deck component for supporting traffic, each modular component including truss type frame components supporting respective deck components and delineating a bottom area; each of said span-forming modular components including longitudinally oriented upper and lower truss chord elements and defining at least one center bay component and at least a pair of center-bay-attached oppositely inclined end ramp-component modules, said ramp component modules being one-half the length of said center bay component when in the folded condition; hinge means disposed adjacent the bottom area of the span for hinging the modules one to another in a manner such that said ramp components are adaptable to fold into collapsed adjacent compact relation to coincide with and not exceed the overall length of said center bay component, and means supporting said spans in side-by-side relation in both a first folded up condition with the deck components in a generally face-to-face storage or travel mode, and in a deployable ready-to-use condition with the deck components unfolded in generally horizontal coplanar relation.

4,962,557

DEVICE FOR OPENING INNER AND OUTER PONTOONS OF A W-SHAPED, UNFOLDABLE PONTOON UNIT CONSISTING OF TWO INNER PONTOONS AND TWO OUTER PONTOONS

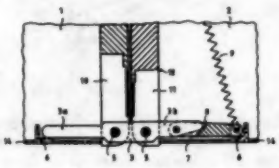
Jan Ghering, Glasheim-Gustvsburg, Fed. Rep. of Germany, assignor to MAN Gutehoffnungshütte, Oberhausen, Fed. Rep. of Germany

Filed Feb. 9, 1990, Ser. No. 478,267

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1989, 3905283

Int. Cl.[5] E01D *15/08, 15/14*

U.S. Cl. 14—27 **6 Claims**



1. A device for opening a pontoon arrangement including a first pontoon structure having an inner pontoon and an outer pontoon and a second pontoon structure having an inner pontoon and an outer pontoon, said pontoon arrangement being openable in the shape of a W, an outer pontoon of the first pontoon structure being attached to the adjoining inner pontoon of the second pontoon structure at a corner of the first inner pontoon and the second outer pontoon, comprising:

a free space provided in a structural element below a pontoon deck of the first inner pontoon; a free space formed in a structural member below a pontoon deck of the second outer pontoon, said inner pontoon free space and said second outer pontoon free space being defined at an adjoining corner of said first and second pontoon structure; a first pin connected to said first inner pontoon at said first inner pontoon adjoining corner; a second pin connected to said second outer pontoon at said second outer pontoon adjoining corner; a lever connected to each of said first and second pins for pivotal movement about said pins, said lever including a first lever part extending under said first inner pontoon and a second lever part extending under said second outer pontoon, said second lever part being connected to a pivot pin engaging a swivelling rocker arm, said swivelling rocker arm including a stop; a tension spring fastened at an end of the rocker arm and fastened to said second pontoon unit for maintaining the spring tensioned in a collapsed state of the inner pontoon and the outer pontoon wherein said stop comes into contact with the end of said projecting part of said lever and said rocker arm forming an extended lever, and in said open state of said inner pontoon and said outer pontoon said tension spring is released, said rocker arm being folded down to form an angle with the projecting part of said lever.

4,962,558

DEVICE FOR CLEANING SURFACES SUBMERGED IN A FLUID

William S. Harrell, Jr., 41 W. Meadowlark La., Lawrenceville, Ga. 30245

Filed Jun. 15, 1989, Ser. No. 366,435

Int. Cl.[5] E04H *3/20*

U.S. Cl. 15—1.7 **50 Claims**

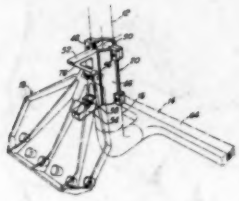
1. A device for cleaning a surface submerged in a fluid at a distance from an operator, comprising:

(a) a pole;

(b) a tool attachable to said pole at a distance from said operator;

(c) a wing member having an attachment side pivotally

attachable to said pole and a distal side opposite said attachment side, said wing member pivotable in relation to said pole for forcing said tool against said surface by hydrodynamic forces when said tool is moved towards and away from said operator;



(d) jetting means provided on said wing member for directing said fluid towards said surface when said tool is moved towards said operator; and

(e) means for pivotally attaching said wing member to said pole.

4,962,559

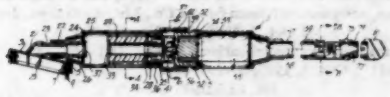
SUBMERSIBLE VACUUM CLEANER

Michael L. Schuman, El Monte, Calif., assignor to Rainbow Lifegard Products, Inc., El Monte, Calif.

Filed Nov. 16, 1988, Ser. No. 272,078

Int. Cl.[5] E04H *3/20*

U.S. Cl. 15—1.7 **19 Claims**



1. A submersible vacuum for cleaning surfaces submerged in a liquid comprising:

an elongated substantially rigid handle having an operating end and an opposite end,

a submersible container coupled substantially rigidly to the opposite end of the handle substantially coaxially therewith at one end of the container and defining a sealed motor chamber and a filter chamber, the container further defining a liquid inlet port to the filter chamber at an opposite end of the container substantially coaxially therewith, the container also defining a liquid discharge opening from the filter chamber to the exterior of the container;

a liquid seal separating the motor chamber from the filter chamber;

a pump impeller and a filter mounted in the filter chamber, the pump impeller and the filter being disposed relative to the inlet port and the discharge opening for flow of liquid through the inlet port, the filter, and the discharge opening in response to the operation of the impeller;

an electric motor mounted in the motor chamber, the motor having a motor shaft extending through the liquid seal to the filter chamber and mounting the impeller thereto;

means for supplying power to the motor enclosed in the motor chamber, and

means for coupling to the inlet port for support and carriage by the container an inlet device cooperable with a surface to be cleaned and defined for flow of liquid therethrough to the inlet port.

4,962,560

CLEANSING APPARATUS

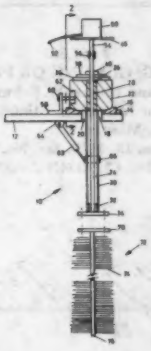
Eric F. Moore, P.O. Box 7021, Dinwiddie, South Africa (1405)

Filed Jun. 3, 1988, Ser. No. 202,235

Claims priority, application South Africa, Jun. 4, 1987, 87/3996

Int. Cl.[5] B60S *3/06*

U.S. Cl. 15—53.3 **5 Claims**



1. Cleansing apparatus for use in a vehicle cleaning system which includes a cleaning device, and mounting means for mounting the cleaning device to a fixed structure including a socket which faces upwardly and which is adapted to be secured to the fixed structure, and a ball which rests in, and which is movable over at least part of the surface of the socket and from which at least the cleaning device is suspended, and drive means for causing the cleaning device to move about an axis, the mounting means permitting at least the cleaning device to move pivotally at least to a limited extent relatively to the fixed structure in at least one direction.

4,962,561

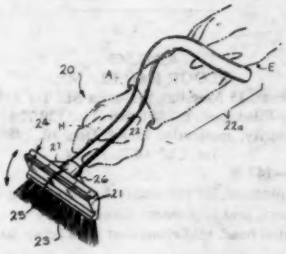
SCRAPING DEVICE

Jonathan W. Hamilton, 4646 Liverance, Okemos, Mich. 48864

Filed Apr. 15, 1988, Ser. No. 182,168

Int. Cl.[5] B60S *1/04*; A47L *1/06*

U.S. Cl. 15—111 **12 Claims**



1. A device for removing ice from vehicle windshields and the like which comprises:

(a) a scraper head means with separated portions having an edge at one of the portions which is moved along the windwhield to remove the ice and having an attachment means adjacent the other of the portions; and

(b) a handle means attached to the attachment means at a proximal end with an arcuate looped section at a distal

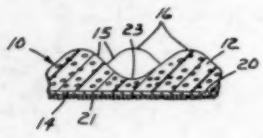
end, wherein the use the hand of the user can grip the handle adjacent the scraper head means with the proximal end of the handle means under the wrist and wherein the looped section has a length and curvature so as to curve from under the forearm of the user to around the upper forearm of the user adjacent to the elbow when covered by a winter coat.

4,962,562

COMPOUNDING, GLAZING OR POLISHING PAD

Richard L. Englund, and Thomas W. Schwartz, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 18, 1989, Ser. No. 298,508
Int. Cl.[5] B24B *29/00*
U.S. Cl. 15—230.16 **17 Claims**



1. A pad for applying glaze to finish paint and adapted to be used on a drive assembly including a back up pad having a generally planar support surface and a drive motor for moving the back up pad in a plane parallel to said support surface during application of the glaze, said paint finishing pad comprising:

a layer of resiliently compressible open cell polymeric foam having a generally planar rear surface and an opposite front surface defined by a plurality of spaced projecting portions of said layer defining recess between said projecting portions, said polymeric foam from which said layer is formed having a compression deflection value of about 0.4 pounds per square inch when compressed twenty five percent and of about 0.65 pounds per square inch when compressed sixty five percent in accordance with the test procedure in ASTM D3574; and

means attached to said rear surface for releasably attaching said paint finishing pad to the support surface of the drive unit.

4,962,563

FLOOR RAG CLAMP

Raphael Bachar, 15 Mesilat Yesharim St., Tel Aviv, Israel

Filed Dec. 7, 1987, Ser. No. 129,724
Claims priority, application Israel, Dec. 10, 1986, 80938
Int. Cl.[5] A47L *13/24*
U.S. Cl. 15—147 R **1 Claim**

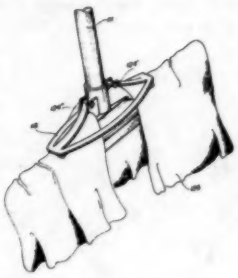
1. An implement for releasably holding a rag in place for washing floors, said implement comprising:

an elongated head, said elongated head being attachable to a stick;

a frame, said frame having an opening for passing over said stick and including opposite ends; and

a pair of elongated flat springs located within said opening, one end of each flat spring being attached to each opposite end of said frame, the free end of each said spring being pivotally attached to said head for movement with respect to said head; said pair of elongated flat springs being flexed to alternately:

(1) bias said opposite ends of said frame toward said elongated head to hold the rag in place between said opposite ends and said elongated head; and



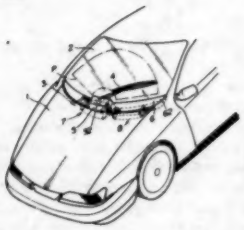
(2) bias said opposite ends of said frame away from said elongated head to release the rag from said implement.

4,962,564

CONCEALED WINDSHIELD WIPER SYSTEM

Kiyoshi Onda, Yokohama, and Tomoo Nakajima, Ebina, both of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Oct. 7, 1988, Ser. No. 254,984
Claims priority, application Japan, Oct. 8, 1987, 62-154446[U]; Oct. 8, 1987, 62-154447[U]
Int. Cl.[5] B60S *1/04*
U.S. Cl. 15—250.19 **5 Claims**



1. In a vehicle including a windshield, a hood in a spaced relationship with the windshield, a cowl box having an opening disposed between the windshield and the hood:

a windshield wiper system including a wiper pivot with a wiper arm carrying a wiper blade adapted to wipe a surface of the windshield;

a pivot container which said wiper pivot of said windshield wiper system is stored in;

a wiper blade container which said blade of said wiper arm is stored in;

said pivot container and wiper blade container having storage positions, respectively, where they are disposed in said cowl box, and lift positions, respectively, where they are projected out of said cowl box; and

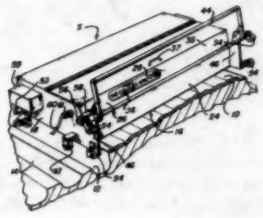
means for lifting said pivot and wiper blade containers from the stored positions to the lift positions according to a predetermined schedule.

4,962,565

AUTOMATIC VACUUM BOWLING LANE STRIPPER

Donald E. Ingermann, Arvada; Ronald L. Smith, Boulder; Stephen F. Caffrey, Arvada, and Looney J. Steinhoff, Evergreen, all of Colo., assignors to Century International Corporation, Golden, Colo.

Continuation-in-part of Ser. No. 371,295, Jun. 26, 1989, Pat. No. 4,920,604. This application Dec. 20, 1989, Ser. No. 453,763
Int. Cl.[5] A47L *11/282*
U.S. Cl. 15—302 21 Claims



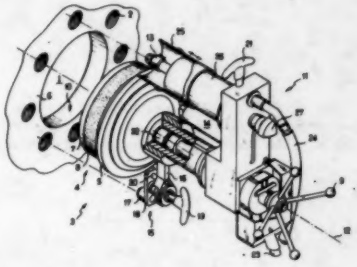
1. An automatic vacuum bowling lane stripper comprising:
a carriage for movement along a bowling alley from a foul line to the pit and back again, said carriage having a forward portion and a rearward position;
a reversible drive mechanism connected to said carriage and having a drive shaft and surface-engaging drive wheels mounted on said drive shaft operative to advance said carriage along a predetermined course in a forward and reverse direction;
cleaner applicator means extending transversely of said carriage at said forward portion;
a cleaner reservoir;
means for supplying cleaner from said reservoir to said applicator, said cleaner supplying means having a fluid valve for permitting the flow of cleaner to said applicator when open and prohibiting flow of cleaner to said applicator when closed;
a vacuum means for removing cleaner and dirt from the surface of the lane, said vacuum means having a vacuum head extending transversely of said carriage rearwardly of said applicator means and mounted for movement with respect to said carriage between an operative lane-engaging position and a retracted position within said carriage and above the lane;
power supply means in said carriage;
control means connected to said power supply means responsive to control signals to selectively activate and deactivate each function of said stripper;
an on-off switch which can be closed for activating said drive mechanism so that said carriage travels in a forward direction from the foul lane to the pit;
first means responsive to said control means for opening said fluid valve during at least a portion of said forward travel;
second means responsive to said control means for moving said vacuum head into said lane-engaging position;
third means responsive to said control means for deactivating said first responsive means to shutoff said fluid valve; and
a limit switch responsive to said carriage reaching the pit to cause said control means to deactivate said drive mechanism to stop said carriage and to deactivate said third responsive means to raise said vacuum head to said retracted position.

4,962,566

MACHINE FOR CLEANING TAPPED HOLES USED FOR AFFIXING THE COVERS TO ARMHOLES AND EYEHOLES IN STEAM GENERATORS

Antoine Gemma, Meudon, France, assignor to Electricité de France (Service National), Paris, France

Filed Mar. 24, 1989, Ser. No. 328,389
Claims priority, application France, Mar. 25, 1988, 88 03968
Int. Cl.[5] A46B *13/02*
U.S. Cl. 15—304 7 Claims



1. Machine (3) for cleaning tapped holes (2) distributed around the periphery of an opening (1), said machine comprising
(a) means (4) for centering and clamping said machine on said opening, thereby enabling said machine to be positioned on the axis (12) of the opening and to be held in position by abutment against a wall (10) of said opening; and
(b) brushing means (13) disposed at a fixed radial distance from said axis of said opening and movable both:
(i) in rotation about said axis (12) of said opening so that a trajectory of said brushing means describes a circle intersecting the axes of tapped holes distributed around a periphery of said opening, thereby enabling said brushing means to be selectively positioned over each of said tapped holes; and
(ii) in axial translation along an axis coinciding with the axis of a tapped hole so as to enable said brushing means to be inserted into and withdrawn from said tapped hole;
(c) said brushing means including a rotary brush rotating about an axis coincident with said axis of said tapped hole, whereby said axial translation performs a cleaning cycle by moving said rotating brush in and then out of said tapped hole.

4,962,567

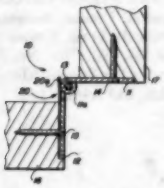
BUTT HINGE ASSEMBLY

Wilbur Dixon, 44 S. Washington St., Beverly Hills, Fla. 32665

Filed Jul. 13, 1989, Ser. No. 379,178
Int. Cl.[5] E05C *17/00*; E05D *11/00*
U.S. Cl. 16—319 3 Claims

1. A butt hinge assembly for a door hinged to a casement which assembly keeps the opened door from moving on its hinges due to air currents or other forces acting on the surfaces of the open door comprising
a conventional butt hinge having two cooperating hinge plates respectively mounted on a casement and a door and joined together by a hinge pin fitted into a plurality of aligned cylindrical knuckles formed on the adjoining ends of the two hinge plates and
a flat tempered spring steel plate sized to fit against the hinge

plate mounted on the casement and positioned between the casement and the hinge plate,



said spring steel plate having a plurality of flat fingers, each finger sized to press firmly against one of the cylindrical knuckles of the hinge plate which is mounted on the door.

4,962,568

METHOD AND APPARATUS FOR AUTOMATICALLY CUTTING FOOD PRODUCTS TO PREDETERMINED WEIGHT OR SHAPE

Norman A. Rudy, Renton, and James S. Tomlin, Seattle, both of Wash., assignors to Design Systems, Inc., Bellevue, Wash.

Division of Ser. No. 171,774, Mar. 22, 1988, Pat. No. 4,875,254. This application Jul. 24, 1989, Ser. No. 383,789

Int. Cl.[5] A22C *25/18*

U.S. Cl. 17—52 **11 Claims**

1. The method of cutting food and like products to desired reduced sizes, comprising:

(a) moving the product on a conveyor from an infeed end to an outfeed end,

(b) determining the length, width and thickness dimensions of the moving product,

(c) providing at least one line-type cutter having the capability of cutting the moving product along linear and nonlinear lines,

(d) selecting one of said linear and nonlinear cutting capabilities for cutting the moving product, and

(e) subjecting the moving product to the selected cutting action of said at least one line-type cutter to cut the moving product along lines predetermined to reduce the product to desires weight or shape.

4,962,569

METHOD AND APPARATUS FOR OBTAINING MEASURING VALUES REPRESENTING THE THICKNESS OF A COHERENT FIBER MASS

Fritz Hösel, Mönchengladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

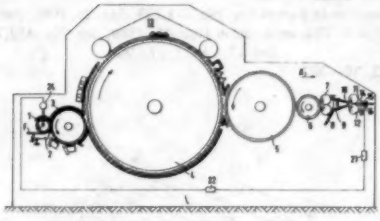
Filed Feb. 3, 1989, Ser. No. 306,308

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1988, 3803353

Int. Cl.[5] D01G *15/46*

U.S. Cl. 19—106 R **20 Claims**

1. In an apparatus for generating measuring values representing the thickness of a coherent fiber material, including an optical device having light transmitter means emitting alight beam and light detector means, means for guiding the fiber material between said light transmitter means and said light detector means and means for processing signals generated by said light detector; the improvement wherein said light detector means comprise first and second image processing CCD



members and said light transmitter means comprise first and second light transmitters; said first and second CCD members being offset at an angle relative to one another and are aligned with the light beam of the first and the second light transmitter, respectively.

4,962,570

THROTTLE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH VEHICLE DRIVING CONDITION-DEPENDENT THROTTLE ANGLE CORRECTION COEFFICIENT VARIABLE

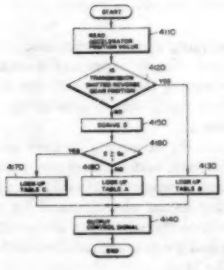
Akio Hosaka, Yokohama, and Kenichi Tanaka, Yokosuka, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Feb. 6, 1985, Ser. No. 698,798

Claims priority, application Japan, Feb. 7, 1984, 59-19367

Int. Cl.[5] F02D *11/10*; B60K *28/16*

U.S. Cl. 123—399 **22 Claims**



1. An intake air flow rate control system for an internal combustion engine comprising:

a manually operable means for producing a demand air flow indicative signal;

a sensor means adapted to monitor vehicle driving conditions in terms of a preselected vehicle driving parameter and to produce a sensor signal representative of the detected vehicle driving conditions, said sensor means including a wheel slippage sensor for producing a wheel slippage indicative signal when wheel slip is detected;

an intake air flow rate adjusting means for controlling air flow rate through an air induction passage of the engine, said intake air flow rate adjusting means being responsive to a control signal to adjust the intake air flow rate in accordance therewith; and

a controller receiving said demand air flow indicative signal and said wheel slippage indicative signal and deriving said

control signal for controlling said intake air flow rate adjusting means, said control signal being variable according to a first predetermined characteristic which is selected from among a plurality of predetermined characteristics on the basis of said wheel slippage indicative signal, said controller including means for digitally storing said plurality of predetermined characteristics which includes a standard characteristic corresponding to a normal, non-slippage vehicle driving condition, said first predetermined characteristic being such as to vary the intake air flow rate relative to said demand intake air flow indicative signal at a lower rate than that in said standard characteristics.

4,962,571

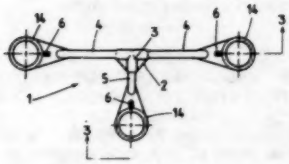
DIAPER OR BABIES NAPKIN FASTENER

Hendrik S. Visser, 160 Stormvoel Street, East Lynne, Pretoria, Transvaal Province, South Africa

Continuation-in-part of Ser. No. 228,295, Aug. 4, 1988, which is a continuation-in-part of Ser. No. 184,285, Apr. 21, 1988, abandoned. This application Jun. 1, 1989, Ser. No. 359,987

Int. Cl.[5] A44B *1/04*

U.S. Cl. 24—301 **11 Claims**



1. A diaper fastener for holding a fabric diaper in position on a baby, the fastener comprising:

a flexible base member at least a part of which is elastically extensible;

at least three spaced relatively rigid claw units attached to the base member, the elastically extensible part of the base member being interposed between at least two of the claw units and wherein each claw unit has a body part in the form of a substantially flat part, means for accommodating gathering of diaper fabric under the flat part comprising a free end region which extends transversely away from the flat part and terminating in means for maintaining the claw units in engagement with the fabric of a diaper without penetrating more than one layer of diaper fabric comprising a series of laterally spaced teeth offset from the plane of the flat part by the free end region and directed inwardly towards a central region of the base member for engaging the fabric and holding the diaper in position on a baby with the elastically extensible part extended; and

a one finger grip integral with the base member, the latter being made of integral elastomeric material, in proximity to each claw unit whereby the claw units may be pulled to extend the elastically extensible part of the base member, and wherein the finger grip is further from the central region of the base member than the attachment of the claw units, and the cross-sectional area of the finger grip is less than the minimum cross-sectional area of the base member between the claw units for deforming preferentially relative to the central region of the base member.

4,962,572

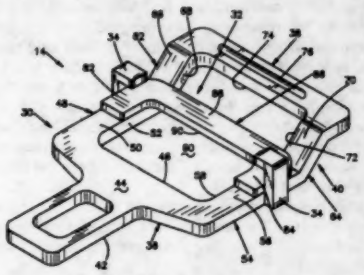
TONGUE ASSEMBLY

David Prentkowski, Warren, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Continuation of Ser. No. 313,714, Feb. 22, 1989, abandoned. This application Feb. 22, 1990, Ser. No. 483,990

Int. Cl.[5] A44B *11/10*

U.S. Cl. 24—323 **9 Claims**



1. A tongue assembly for use in a safety apparatus in which a belt restrains movement of an occupant of a vehicle, said tongue assembly comprising:

a base having a leading end portion , a trailing end portion and a connector portion extending at an angle between said leading and trailing end portions, said leading end portion including a latching section for connection to a cooperating part and having the terminal end of said base, said leading end portion having a first major side surface extending form the terminal end of said base and lying in a first plane, said tailing end portion having a second major side surface lying in a second plate which is offset from and parallel to the first plane, said base having an opening which extends through said leading end portion and through said connector portion, said trailing end portion having a clamping edge spaced from said leading end portion and which is least partially defines said opening; and

a lock bar slidable along said leading end portion and said connector portion of said base, said lock bar having first and second end portions and an intermediate portion extending between said first and second end portions and spanning said opening;

said lock bar having a first portion disposed at least partially on said connector portion and adjacent said clamping edge, and a second position in which said lock bar is disposed on said first major side surface on said leading end portion and spaced apart from said clamping edge.

4,962,573

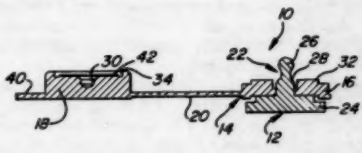
CLASP FOR RETAINING CONTAINERS

Frank L. Breveglieri, Spring Lake, Mich., assignor to Geerpres, Inc., Muskegon, Mich.

Filed Oct. 17, 1989, Ser. No. 422,739

Int. Cl.[5] A44B *1/38*

U.S. Cl. 24—573.1 **8 Claims**



1. A reusable clasp for retaining a disposable flexible container mounted on a supporting surface, comprising:

a first male member having a base and a stud projecting

therefrom, said first male member to be removably attached to the support surface such that said stud extends from said surface, said stud including an end freely extending from said first male member;

a ball formed on the free extending end of said stud, and a groove retainer member on said stud positioned adjacent said base;

a second female member having a first ring member and a second ring member, said first ring member having an opening for removably securing said first ring member with said groove retainer member on said stud such that the support surface is sandwiched between said base of said first male member and said first ring member and enabling the free extending end of said stud to pass through said first ring member, said second ring member having a socket member for removably receiving said ball on said stud for removably locking said second ring member with said ball; and

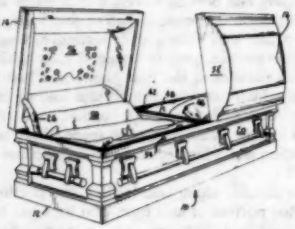
a flexible member integrally connecting said first and second ring members for enabling said second ring member to move relative to said first member for removably securing to said ball.

4,962,574

PLURAL DISPLAY CASKET

John W. Estes, P.O. Box 339, Osawatomie, Kans. 66064

Filed Jan. 5, 1990, Ser. No. 461,415
Int. Cl.[5] A61G *17/00*
U.S. Cl. 27—2 **8 Claims**



1. A burial casket for receiving a deceased person, said casket comprising:

a casket structural body;

a top having two substantially equal portions each having outer ends and inner ends, and a bridge cut adjacent said inner ends of said top portions defined by an elongated void extending transversely across a longitudinal axis of said structural body, each of said portions hingedly secured to said body on opposed sides thereof;

at least two hinge means attaching each of said top portions to said body, a first pivot hinge means located adjacent each of said outer ends of said top portions and a second swing hinge means located adjacent each of said inner ends of said top portions, said first hinge means adapted to allow said associated top portion to swing about the axis of said first hinge means, and said second hinge means adapted to be manually released from and resecured to said structural body; and

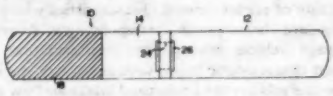
wherein a first said top portions is selected and defines a head end of said casket, and wherein when said second swing hinge associated with a second unselected said top portion is temporarily detached from said body, said associated unselected top portion can be swung across said structural body about the axis of said first pivot hinge to a position perpendicular to the longitudinal axis of said body, and said unselected top portion can then be returned to its original, hingedly secured position.

4,962,575

HAND POSITIONING DEVICE

Bernard A. Yonke, 205 Prospect Ave., Pewaukee, Wis. 53072

Filed Aug. 15, 1988, Ser. No. 232,213
Int. Cl.[5] A01N *1/00*
U.S. Cl. 27—21.1 **1 Claim**



1. A device for securing a plurality of inert body parts in selected position relative to each other including:

(a) a pair of hands of elongated material, generally rectangular in plan view and having opposed faces;

(b) female joining means secured to one face of said material;

(c) male joining means secured to another face of said material for interconnection of the said faces;

(d) an aperture in each of said bands of material provided with an aperture defining marginal grommet;

(e) a securing cord threaded through the apertures such that the ends may be pulled to draw the bands and thus the body parts together when the bands are wrapped and joined male to female;

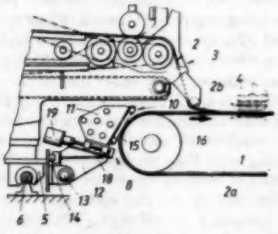
(f) a slide for the cording having a locking member, said slide having slide channels through which the cording may be fed and snugged to the desired body parts relationship after which the locking member may be manually axially, slideably positionable to lock and unlock the structure to position and adjust the body parts relationship in the desired positions relative to each other.

4,962,576

PROCESS AND APPARATUS FOR NEEDLING A NON-WOVEN STRIP TO A REVOLVING ENDLESS CARRIER WEB

Klaus Minichshofer, Linz; Peter Müller, Marchtrenk, and Hannes Pum, Wels, all of Austria, assignors to Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft, Leonding, Austria

Filed Nov. 16, 1989, Ser. No. 438,536
Claims priority, application Austria, Nov. 22, 1988, 2859/88
Int. Cl.[5] D04H *18/00*
U.S. Cl. 28—110 **17 Claims**



1. In a process of needling a non-woven strip to an endless carrier web, comprising

continuously revolving said endless carrier web in its longitudinal direction on conveyer means,

feeding said non-woven strip to said revolving carrier web at a predetermined lead angle to said longitudinal direction,

applying said non-woven strip to said revolving carrier web,

imparting to said non-woven strip as it is fed and applied to said carrier web a traversing movement relative to said carrier web in a direction which is transverse to said longitudinal direction, whereby said non-woven strip is

caused to form on said carrier web a plurality of consecutive convolutions, which extend generally at said lead angle to said longitudinal direction,

detecting the position and longitudinal direction preceding one of said convolutions before said non-woven strip is applied to said carrier web to form the next succeeding one of said convolutions,

controlling said traversing movement of said non-woven strip relative to said carrier web in dependence on the thus detected position and longitudinal direction of the last preceding one of said convolutions so that said non-woven strip for forming said next succeeding convolution is applied to said carrier web in contact with said last preceding convolution, and

continuously needling said non-woven strip to said carrier web,

the improvement comprising that

said non-woven strip of each of said convolutions is initially needled to said carrier web only in a width portion which trails in the direction of said traversing movement whereas said non-woven strip is initially left non-needled in a marginal portion thereof which leads in the direction of said traversing movement and has a free longitudinal edge facing in the direction of said traversing movement,

the position and direction of said free longitudinal edge are detected before said non-woven strip for forming the next succeeding one of said convolutions is applied to said carrier web, and

said initially non-needled marginal portion of each of said convolutions is needled to said carrier web on said conveyor means when at least part of said non-woven strip for the next succeeding one of said convolutions has been applied to said carrier web on said conveyor means.

4,962,577

WORK ROLL WITH IMPROVED SUPPORT AND LUBRICATING SYSTEM FOR AN HYDRAULICALLY SUPPORTED ROLL

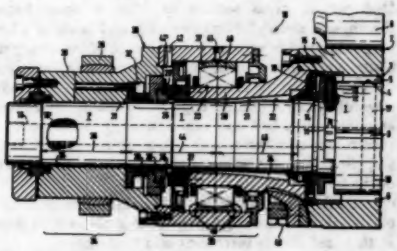
Klaus Kubik, Tonisvorst, and Karl-Heinz Kuesters, Krefeld-Forstwald, both of Fed. Rep. of Germany, assignors to Eduard Küsters Maschinenfabrik GmbH & Co. KG, Krefeld, Fed. Rep. of Germany

Continuation of Ser. No. 355,045, May 15, 1989, abandoned, which is a continuation of Ser. No. 25,603, Mar. 13, 1987, abandoned. This application Mar. 14, 1990, Ser. No. 494,806

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1986, 3608374; Nov. 22, 1986, 3639935

Int. Cl.[5] B21B *27/00*

U.S. Cl. 29—116.2 **6 Claims**



1. In a roll having a rotating hollow roll forming a working roll circumference at its outer diameter and a stationary cross piece extending through the hollow roll forming a clearance space therewith, with said cross piece having ends protruding from the hollow roll to which external forces may be applied and a means including a liquid for hydraulically supporting the hollow roll provided at the cross piece, said hollow roll further having a bearing arranged at each of its ends which rotatably supports the hollow roll and to which lubricant is conducted, the improvement comprising:

(a) a deflectable bearing housing having a large diameter region and a small diameter region;

(b) an axial extension having one end remote from said hollow roll and another end adjacent said hollow roll, said adjacent extension end attached to one end of the hollow roll, said extension having an outer diameter smaller than the outer diameter of the hollow roll with a portion of said extension disposed within the large diameter region of the bearing housing;

(c) said bearing being located between the outer diameter of the extension and an inner circumference of said large diameter region of said bearing housing; and

(d) said cross piece extending through said axial extension with radial play, thereby forming a space therebetween, and into a bore in said small diameter region of the bearing housing without appreciable radial play thereby forming a support distance within said small diameter region for supporting one end of the cross piece, said small diameter region of the bearing housing being directly connected to said cross piece over said support distance such that the bearing housing follows the deflections of the cross piece and the applied external forces act on an outer circumference of said small diameter region to support the roll.

4,962,578

RESIN CALENDER ROLL

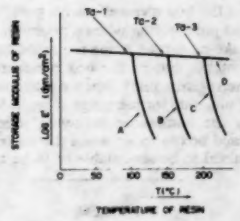
Yuji Saito, Urawa; Kazuo Yamada, Kawasaki; Akiyoshi Inoue, and Yasuhiro Takaoka, both of Yokohama, all of Japan, assignors to Kinyosha Co., Ltd., Tokyo, Japan

PCT No. PCT/JP87/00369, § 371 Date Feb. 2, 1989, § 102(e) Date Feb. 2, 1989, PCT Pub. No. WO88/09846, PCT Pub. Date Dec. 15, 1988

PCT Filed Jun. 10, 1987, Ser. No. 309,668

Int. Cl.[5] B21B *31/08*

U.S. Cl. 29—132 **6 Claims**



1. A resin calendar roll having a metal core and a resin surface layer formed on the metal core, the resin having a storage modulus, wherein:

the storage modulus of said resin of said resin surface layer has a characteristic inflection point whose temperature is 10°–80° C. higher than a temperature of the resin surface layer during operation of the resin calendar roll; and further wherein a Shore D hardness of the resin falls within the range of 75 to 97.

4,962,579

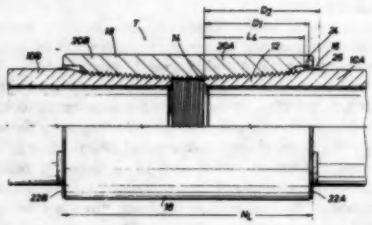
TORQUE POSITION MAKE-UP OF TUBULAR CONNECTIONS

Mark C. Moyer, Missouri City, Tex.; James B. Day, New Orleans, La., and Alan J. Hirshberg, Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Continuation of Ser. No. 239,874, Sep. 2, 1988, abandoned. This application Oct. 2, 1989, Ser. No. 415,473

Int. Cl.[5] B23Q 17/00

U.S. Cl. 29—407 **11 Claims**



1. Method of connecting threaded pipe sections to form a made-up tubular joint having proper sealing positioning at proper make-up torque, the method comprising the steps of:

providing a first pipe section including a threaded pin member having a face at its end, the first pipe section having been marked to provide a registry mark of a prescribed width at a predetermined position measured a distance from the end of the pin member, said predetermined position being uniform for any pin member of similar size, grade, weight, and thread form, the distance being determined for a pin member of a particular size, grade, weight, and thread form prior to make-up of the joint,

providing a second pipe section including a corresponding threaded box member having a face at its end,

screwing the pin member and box member together continuously with a make-up torque to form a made-up tubular joint,

determining that the made-up tubular joint is acceptable during the continuous screwing together of the pin member and box member when (1) the face of the end of the box member is properly positioned relative to the registry mark on the first pipe section, and (2) the make-up torque is within a predetermined make-up torque range, or

determining that the made-up tubular joint should be rejected during the continuous screwing together of the pin member and the box member when either (1) the face of the end of the box member moves past the registry mark on the first pipe section when a minimum of the predetermined make-up torque range is applied to the joint; or (2) the face of the end of the box member does not move within the registry mark when a maximum of the predetermined make-up torque range is applied to the joint, and

terminating the continuous screwing together of the pin member and box member when the made-up tubular joint is determined to be acceptable or to be rejected.

4,962,580

METHOD OF AND APPARATUS FOR MANUFACTURING SLIDE FASTENER STRINGERS

Yasuhiko Matsuda, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

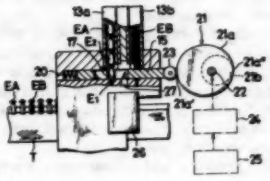
Filed Feb. 16, 1990, Ser. No. 480,892

Claims priority, application Japan, Feb. 27, 1989, 1-45780

Int. Cl.[5] B21D 53/52

U.S. Cl. 29—410 **6 Claims**

1. In the manufacture of a slide fastener carrying a discrete formation of a plurality of groups of colored coupling elements in selected orders and at predetermined intervals along a longitudinal edge of a stringer tape, a method which comprises the steps of receiving and feeding a plurality of differently colored coupling elements selectively one at a time from respective vertically disposed chutes, transferring said one coupling element horizontally to a predetermined position for gravity fall



onto the longitudinal edge of the tape and clamping said one element in place, followed by receiving and feeding a next selected one of said colored elements from the corresponding one of said chutes.

4,962,581

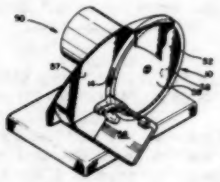
BLADE SHEATH FOR USE IN CLEANING A MEAT SLICER BLADE AND METHOD OF USE THEREOF

Edmond P. Rutigliano, 2519 South Franklin St., Philadelphia, Pa. 19148

Filed May 20, 1988, Ser. No. 196,315

Int. Cl.[5] B08B 7/00; B26D 7/22

U.S. Cl. 29—426.1 **1 Claim**



1. A method for cleaning the blade of a rotary slicing machine, said machine including a housing, a rotatable circular disk blade, a stationary blade guard, and a table, said method comprising the steps of:

(a) disconnecting electric power from the machine;

(b) providing a slicer blade sheath, said sheath being a narrow strip of generally flexible material and generally U-shaped in cross section to form a channel-shaped sheath, said sheath having two ends and being of a length predetermined to span a circumference of the rotary slicer blade when said sheath ends are touching, whereupon flanged sides of the channel-shaped sheath extend radially inwardly from a cutting edge of the blade by a minimal amount, and a bail and clip connector attached to said sheath ends to cause said sheath to be continuous, the bail and clip connector having a span along the circumference of the blade;

(c) positioning said sheath around the circumference of said blade, said bail and clip being in an open position thereof, so that said sheath surrounds said blade edge;

(d) locking said sheath to said blade edge by closing said bail and clip connector, whereupon the sheath is shortened circumferentially by said span and drawn radially inward over the blade edge, by operation of the bail clip, the user's fingers remaining clear of the blade edge;

(e) removing said slicer's blade guard;

(f) cleaning said machine's table, moving parts and blade's surfaces, including axially-facing surfaces of said blade;

(g) replacing said blade guard;

(h) loosening said blade sheath by opening said bail and clip

connector, whereupon the sheath clears the blade, the user's fingers remaining clear of said blade edge;

(i) removing said blade sheath from said blade.

4,962,582

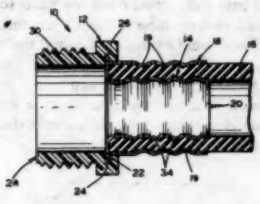
METHOD OF MAKING A COMPOSITE MALE HOSE COUPLER HAVING INTEGRALLY MOLDED NUT

Kenneth B. Puls, Battle Creek, Mich., assignor to Wiggler Stamping Company, Montpelier, Ohio

Division of Ser. No. 313,088, Feb. 21, 1989, Pat. No. 4,850,620. This application May 11, 1989, Ser. No. 350,292

Int. Cl.[5] B22D *19/02*

U.S. Cl. 29—527.4 2 Claims



1. A method of producing a composite male hose coupler including a metallic tail piece and an integrally molded nut of plastic material, comprising:

(A) forming a metallic tail piece with said cylindrical portion having a longitudinal axis, said metallic tail piece terminating in a radial flange portion which is generally perpendicular to and surrounds the longitudinal axis of the cylindrical portion;

(B) placing the flange portion of said metallic tail piece into a mold cavity surrounding said flange portion and defining a desired configuration of said nut;

(C) forming said desired configuration of said nut by filling said mold cavity with a plastic material, thereby causing the plastic material to surround and embed the flange portion of said metallic tail piece and thereby forming a completed composite male hose coupler;

(D) curing the plastic material; and

(E) removing the completed composite male hose coupler from the mold cavity.

4,962,583

TUNNEL TYPE OR DRAGON-GATE TYPE PROCESSING SYSTEM ASSEMBLED WITH SELECTED ELEMENTS AND ITS RELATED INTERFACE MEANS

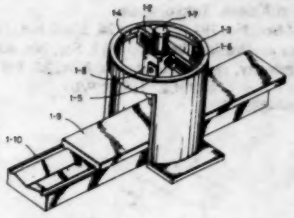
Tai-Her Yang, 5-1 Tay Pyng St., Shi Hwu Jeau, Jang Huah Shian, Taiwan

Continuation of Ser. No. 426,188, Sep. 28, 1982, abandoned. This application Oct. 17, 1988, Ser. No. 258,088

Int. Cl.[5] B23Q *3/157*

U.S. Cl. 29—568 10 Claims

1. A machining center, comprising a table for supporting a workpiece thereon, a lateral beam above the table and parallel thereto, means for rotatably supporting the lateral beam about a first vertical axis, a tool carriage supported on the lateral beam for longitudinal sliding movement thereon, thereby positioning the tool carriage for universal circumferential and radial movement of the tool carriage relative to the table and the workpiece thereon, a cutting tool element on the tool carriage and driven about a second vertical axis and means for



engaging the cutting tool element with the workpiece on the table.

4,962,584

MANUFACTURING METHOD FOR A MAGNETIC DISK RECORDING REPRODUCING HEAD DEVICE

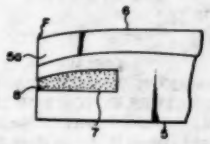
Kyoya Matsuda, Yokohama; Yoshiharu Fujioka, Yamato, and Shoji Tsutaki, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

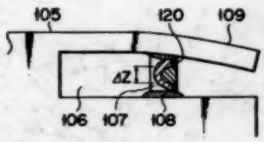
Division of Ser. No. 152,764, Feb. 5, 1988, Pat. No. 4,910,621. This application May 26, 1989, Ser. No. 357,729

Claims priority, application Japan, Feb. 9, 1987, 62-26231; Sep. 30, 1987, 62-243977

Int. Cl.[5] G11B *5/127*

U.S. Cl. 29—603 3 Claims





1. A method for manufacturing a magnetic disk recording-/reproducing head device, said method comprising the steps of:

forming a groove portion in one end of a slider member constituting a magnetic head in a direction parallel to sliding surfaces of said slider member;

sealing in a melted state a sealing agent having an adhesive property upon melting and a shrinking property upon stiffening in said groove portion and;

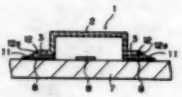
stiffening said sealing agent sealed in said groove portion so as to form an inwardly recessed tapered portion on part of said sliding surface.

4,962,585

CONNECTIVE JUMPER AND METHOD OF MANUFACTURING THE SAME

Eiji Kobayashi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 197,971, May 24, 1988, Pat. No. 4,907,991.
This application Dec. 20, 1989, Ser. No. 453,857
Claims priority, application Japan, Nov. 25, 1987, 62-298111
Int. Cl.[5] H01R 9/09
U.S. Cl. 29—885 5 Claims



1. A method of manufacturing a connective jumper provided to extend over a pair of conductors on an insulating substrate to be soldered to said conductors, said method comprising:

a first step of defining a plurality at holes longitudinally along a strip-shaped metal plate at intervals;

a second step of performing plating over the entire surface of said strip-shaped metal plate provided with said holes;

a third step of cutting said plated strip-shaped metal plate along the cross direction through the positions of said holes to make segments; and

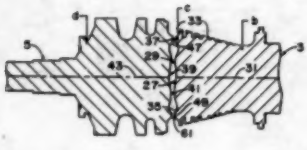
a fourth step of shaping the segments so as to be given prescribed form by a press.

4,962,586

METHOD OF MAKING A HIGH TEMPERATURE - LOW TEMPERATURE ROTOR FOR TURBINES

Robert E. Clark, Orlando; Robert L. Novak, Winter Springs, both of Fla., and Dennis R. Amos, Rock Hill, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 29, 1989, Ser. No. 442,966
Int. Cl.[5] B21K 3/04
U.S. Cl. 29—889.2 8 Claims



1. A method of forming a turbine rotor from separate rotor segments comprised of different alloy materials comprising:

providing a first rotor segment, of an alloy material, having a longitudinal axial center line, an outer surface, and a first end face, with a cavity in said first end face, extending radially from the axial center line of said first rotor segment to a location spaced from the outer surface thereof, forming a first axially extending annular flange having an axially facing surface;

providing a second rotor segment, of another alloy material, having a longitudinal axial center line, an outer surface, and a second end face, with a cavity in said second end face, extending radially from the axial center line of said second rotor segment to a location spaced from the outer surface thereof forming a second axially extending annular flange having an axially facing surface;

welding a clad layer of filler material onto the axially facing surface of the annular flange of the first end face, with a portion thereof extending beyond the outer surface of said first rotor segment;

machining the clad layer so applied to provide a smooth surface thereon;

heat treating said applied layer and contiguous section of the annular flange of said first rotor segment;

aligning said first and second rotor segments with said end faces confronting each other and said annular flanges in spaced adjacent relationship to provide a welding root opening therebetween;

welding said first and second rotor segments together across said welding root opening to form a juncture weld, with a portion of said weld extending beyond the outer surfaces thereof;

heat treating said juncture weld; and

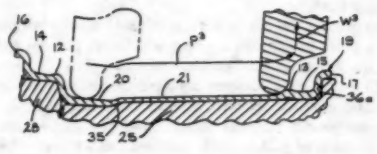
machining said juncture weld to form a smooth surface thereof complementary with the outer surface of said first and second rotor segments.

4,962,587

METHOD OF MAKING A WHEEL RIM

Walter L. Ashley, Jr., Detroit; Daniel F. Jansen, Saline, and George Y. Meyer, Jr., Birmingham, all of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed Apr. 21, 1989, Ser. No. 341,383
Int. Cl.[5] B21H 1/10
U.S. Cl. 29—894.35 7 Claims



1. A method of producing a wheel rim comprising the steps of:

(a) providing a preformed wheel rim having a first predetermined axial width and including a tire bead seat formed at one axial end, an opposite axial end axially spaced from the tire bead seat, and a generally axially extending intermediate leg located between the opposite axial end and the tire bead seat;

(b) providing a mandrel having a generally axially extending forming surface and a bead seat stop surface extending generally radially outwardly from one end thereof;

(c) inserting the mandrel into the rim such that the intermediate leg of the rim surrounds the forming surface of the mandrel and the bead seat stop surface is axially spaced from the bead seat by a predetermined amount;

(d) securing the opposite axial end of the rim relative to the mandrel to prevent any relative axial movement therebetween; and

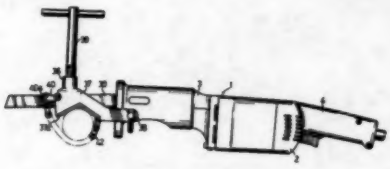
(e) subsequent to step (d), thinning only the intermediate leg of the rim to axially stretch the rim until the bead seat engages the bead seat stop surface provided on the mandrel to produce a wheel rim having a second predetermined width greater than said first predetermined width by the predetermined amount.

4,962,588

PORTABLE RECIPROCATING SAW

Fusao Fushiya; Takashi Yamazaki, and Mitsuyoshi Shibata, all of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan

Filed Apr. 7, 1989, Ser. No. 334,531
Claims priority, application Japan, Apr. 11, 1988, 63-48449; Mar. 4, 1989, 1-24895
Int. Cl.[5] B27B *11/00*
U.S. Cl. 30—372 12 Claims



1. A portable reciprocating saw comprising:

a tool housing including a front end, a rear end and a pair of opposed longitudinal sides between said front and rear ends;

an electric motor mounted to said tool housing and having a rotatably driven output shaft;

a longitudinally elongated slider for supporting a saw blade, said elongated slider extending in a longitudinal direction in said tool housing between said front end and said rear end; and

motion converting means mounted in said tool housing for converting rotation of the output shaft of said electric motor into a reciprocating motion of said slider in said longitudinal direction, said motion converting means including

a bevel gear rotatable about a central axis and meshing with said output shaft of said electric motor, said bevel gear axis being inclined laterally toward a side of the housing,

a slider block mounted on said slider and having a guide groove formed on a lower surface thereof in a direction transverse to the said longitudinal direction of said slider, and

an eccentric pin mounted on the bevel gear at a position eccentric from the center of said bevel gear and loosely fitted in said guide groove of said slider block;

whereby, during operation of said electric motor, said slider performs a composite orbital motion including a reciprocating motion in said longitudinal direction and a pivotal motion about a pivot axis extending transverse to said longitudinal direction.

4,962,589

OFFSET SIGHT

Michael J. LaRosa, 8003 A General Grant Dr., Fort Drum, N.Y. 13602

Filed Sep. 26, 1989, Ser. No. 412,910
Int. Cl.[5] F41G *1/42*
U.S. Cl. 33—233 8 Claims

1. In a weapon sighting system an offset sighting device for easy mounting and dismounting on a weapon so that soldiers wearing chemical protective gear may effectively engage targets comprising:

a generally rectangular base plate member;

a pair of spaced apart bracket members disposed at right angles to said plate member along one edge thereof;

an adjustable L-shaped clamping bracket adapted to be mounted on said plate in handle clamping juxtaposition with said pair of bracket members;

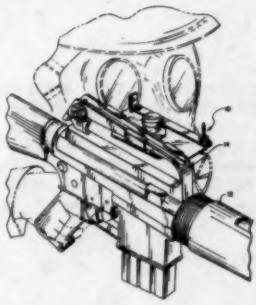
an elongated slot in the base of said L-shaped bracket;

an enlarged tightening knob inserted through said slot and threadably engaging in said base member to selectively fix said adjustable clamping bracket to said base member;

a sight bar adapted to be pivotally mounted on said base plate member said sight bar being laterally displaced from a barrel of the weapon upon said base plate, and having at one end an L-shaped vertical portion;

a sight peep hole in the vertical portion of said bar and a mounting hole adjacent the other end;

a threaded sight pin adapted to be inserted through said sight bar mounting hole to adjustably engage a portion of said base member so as to vertically position said sight pin for a desired elevation and to pivotally mount one end of said sight bar to said base member;



a second hole in said sight bar adjacent said vertical portion;

an elongated adjusting slot in an offset portion of said base member offset from the barrel of said weapon, positioned in operative alignment with said second hole in said sight bar;

screw means for selectively fixing the sight bar in said adjusting slot in said base member at a desired offset;

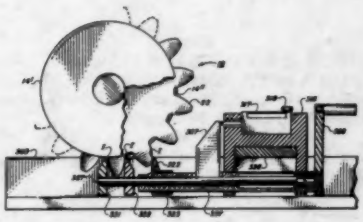
whereby the sighting system of the weapon may be offset from regular sights sufficiently to allow target sighting and acquisition while wearing chemical protective clothing.

4,962,590

APPARATUS AND METHOD FOR TESTING PARAMETERS OF INVOLUTE GEARS AND PINIONS

Wilfred G. Ambrose, 4527 W. Orangewood Ave., Glendale, Ariz. 85301

Continuation of Ser. No. 87,225, Aug. 20, 1987, abandoned. This application Apr. 13, 1989, Ser. No. 338,541
Int. Cl.[5] G01B *5/20, 5/24;* G01M *13/02*
U.S. Cl. 33—501.14 15 Claims



1. Apparatus for measuring departures from an ideal gear tooth profile for an involute gear, said apparatus comprising:

a first and a second wheel adapted to be concentrically mounted on each side of said involute gear, an outer sur-

face of each of said first and said second wheel having a same radius as a base circle of said involute gear;

track apparatus having a linear surface, said linear surface including a first and a second surface for having said outer wheel surfaces applied thereto;

probe apparatus having a probe point for contacting a gear tooth surface of said involute gear, said probe point measuring departures from an equilibrium position; and

adjusting apparatus coupled to said track apparatus and to said probe apparatus for positioning said probe point in contact with said gear tooth surface of said involute gear in a plane parallel to an involute gear axis and coinciding with said linear surface.

4,962,591

CALIBRATION-TEST MEMBER FOR A COORDINATE-MEASURING INSTRUMENT

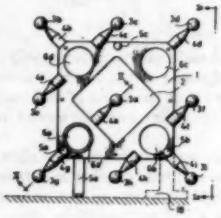
Rudolf Zeller, Winzingen, and Joachim Neumann, Oberkochen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed Sep. 27, 1989, Ser. No. 413,374

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1988, 3833578

Int. Cl.[5] G01C *25/00*

U.S. Cl. 33—502 **7 Claims**



1. A test standard for coordinate-measuring instruments and machine tools, comprising a flat plate which is constructed symmetrically on opposite sides of a central plane of symmetry at the mid-thickness of said plate, a plurality of balls fixedly mounted to said plate with all ball centers in said plane of symmetry, said balls being mounted with such clearance with respect to said plate as to provide ball-contacting measurement-probe access from each side of the said plane of symmetry.

4,962,592

METHOD AND DEVICE FOR REMOVING LIQUID FROM A MIXTURE OF SOLIDS AND LIQUIDS

Alexander H. Orisand, Biltheven, Netherlands, assignor to Pannevis B. V., Utrecht, Netherlands

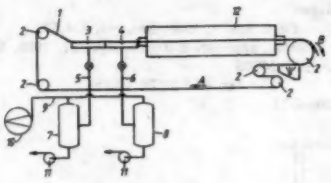
Filed Apr. 19, 1989, Ser. No. 340,468

Claims priority, application Netherlands, Apr. 21, 1988, 8801037

Int. Cl.[5] B01K *5/00*

U.S. Cl. 34—1 **12 Claims**

1. A method for removing liquid from a mixture of solids and liquids, where the mixture is deposited on the upper part of an endless drivable filter belt and whereby during operation the upper part of the filter belt is led over at least one first casing in which sub-atmospheric pressure is generated, wherein said first casing is not located inside a microwave oven, characterized in that, after having passed the casing(s) in which a sub-atmospheric pressure is generated, the mixture is carried



through at least one microwave oven by means of the filter belt.

4,962,593

ORTHOTIC AND METHOD OF MAKING OF THE SAME

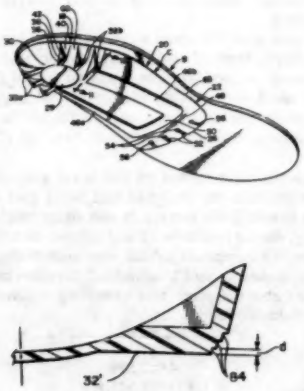
Dennis N. Brown, Custer, Wash., assignor to Northwest Podiatric Laboratory, Inc., Blaine, Wash.

Continuation of Ser. No. 142,722, Jan. 11, 1988, Pat. No. 4,803,747, which is a continuation of Ser. No. 837,584, Mar. 7, 1986, Pat. No. 4,718,179. This application Dec. 21, 1988, Ser. No. 287,846

The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.

Int. Cl.[5] A43B *13/41, 13/40*

U.S. Cl. 36—44 **13 Claims**



1. An orthotic insert, comprising:

a. a relatively rigid, resilient cap having a heel portion, said cap member being generally contoured to fit a plantar surface of a person's foot, with said foot being in a desired position;

b. said cap having stabilizing element means connected to and extending downwardly from a lower surface of the heel portion of the cap;

c. said stabilizing element means having indicating means thereon to indicate incremental depth locations to which said locating elements can have material removed therefrom, whereby an angular position of said insert corresponding to said incremental depth locations can be accomplished by removal of material to said depth locations.

4,962,594

ADJUSTMENT DEVICE OF THE FLEXIBILITY FOR SKI BOOTS

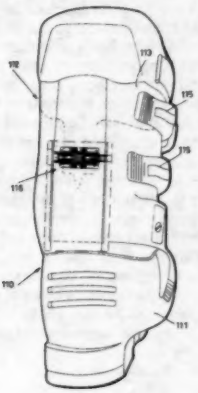
Antonello Marega, Montebelluna, Italy; Peter Knights, Sharon, Vt., and Pierluigi Lorati, Ponte di Legno, Italy, assignors to Calzaturificio Tecnica SpA, Treviso, Italy

Filed Jul. 7, 1989, Ser. No. 376,654

Claims priority, application Italy, Jul. 7, 1988, 21270 A/88; Nov. 28, 1988, 22212/88[U]

Int. Cl.[5] A43B *5/04*

U.S. Cl. 36—117 **16 Claims**



1. In a ski boot having a shell with rear, front and side portions and an uppermost terminating edge, and a leg portion hinged to the shell to provide forward flexure of the leg portion with respect to the shell, the improvement comprising at least one generally vertical opened slot extending downwardly from the terminating edge of the shell and having generally opposed vertical slot edges and wherein said slot is disposed rearwardly of the shell, and an adjusting device for externally adjusting the limit of flexure of the shell of the boot while the boot is on the foot of the wearer, said device being engagable with the edges of the slot such that when forward flexure of the leg portion takes place the slot edges move from a non-engaging opened position and approach each other to a limit adjustably set by the adjusting device and when the forward flexure of the leg portion is released, the slot edges return to the opened position, whereby the limit of flexure of the boot is adjustable.

4,962,595

SKI SHOE

Johann Perner, Graz, Austria, assignor to Koflach Sport Gesellschaft m.b.H. & Co. KG, Vocklabruck, Austria

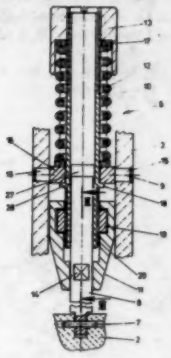
Filed Sep. 11, 1989, Ser. No. 404,980

Claims priority, application Austria, Sep. 9, 1988, 2221/88

Int. Cl.[5] A43B *5/04*

U.S. Cl. 36—121 **7 Claims**

1. Ski shoe with a shell (2) and an upper or cuff (3) pivotably hinged on the shell, in which shell and upper or cuff are connected to one another by spring element (12) and tension member (6) engaging the spring element is pivotably attached on shell (2), said tension member (6) consists of at least two parts (8, 10) that can be slid lengthwise in relation to one another and means permitting said parts (8, 10) of tension member (6) to be detachably locked with one another in at least one slide position, and a first part (8) of tension member (6) is pivotably attached on the shell and a second part (10) of the tension member is pivotably attached to upper or cuff (3), characterized in that spring (12) placed between second part (10) of tension member (6) and upper or cuff (3) encompasses second part (10) from the outside and is placed between a spring plate (17) that can be slid in the axial direction of second part (10) and can be attached in the respective slide position and a disk



(16) exhibiting support pins (15), wherein disk (16) exhibiting support pins (15) on the outside of second part (10) can be slid in its axial direction against the force of spring (12).

4,962,596

SPORT SHOE SOLE

Pierre Dufour, Menthon-St-Bernard, France, assignor to Salomon S. A., Annecy Cedex, France

Filed Dec. 22, 1988, Ser. No. 288,066

Claims priority, application France, Dec. 22, 1987, 87 18334

Int. Cl.[5] A43B *5/00*; A43C *13/04*

U.S. Cl. 36—134 **13 Claims**

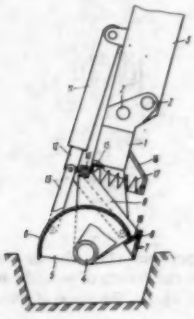
1. Sports-shoe sole equipped with studs of a harder material than a material making up the sole, said studs each comprising a base and a tip and being inserted in the sole at the level of said base, wherein the base (4, 24, 34, 44, 54, 64, 74, 84, 94, 104) of each of said studs (2, 20, 30, 40, 50, 60, 70, 80, 90, 100) is inserted in the sole and held in position in such a way that its bottom surface (5) is kept flush with a walking surface (6) of the sole (1) by a means of insertion (11, 27, 37, 47, 57, 67, 77, 87, 97, 107) which is recessed from said bottom surface, and wherein said base is extended progresively toward the tip by at least one curved, connecting surface (7, 7') having an arc-shaped section tangent to said bottom surface and extending, by means of another section, toward the tip (3, 23, 33, 43, 53, 63, 93, 103) to a point marking at least one-third of the way up a functional height (9) of the stud.

4,962,597

IMPLEMENT OF AN EXCAVATING MACHINE

Saulius I. Kutra, ulitsa Melioratorju 14, kv. 1; Ian I. Tokarev, ulitsa Tsopa, 4, kv. 16; Cheslovas V. Chinkas, ulitsa Melioratorju, 22, kv. 19; Kazimieras-Motejus K. Dokshus, ulitsa Melioratorju, 8, kv. 12, and Antanas-Sigitas V. Shilelka, ulitsa Nevezhio, 37, all of Litovskaya SSR, Kedainsky raion, derevnya, U.S.S.R.

Filed Dec. 8, 1989, Ser. No. 447,901
Int. Cl.[5] E02F 3/00
U.S. Cl. 37—117.5 3 Claims



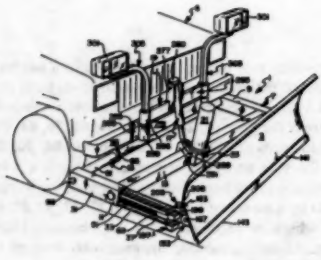
1. An implement of an excavating machine comprising:
a frame mounted on a boom of the excavating machine;
a pivot secured on said frame;
a knife with a blade pivotably secured on said pivot and spring-urged thereto;
a bucket with a lip arranged at said pivot to be capable of assuming open and closed positions;
a stop element for limiting the downward travel of said knife disposed at said frame in the travel path of said knife;
a system for controlling the bucket, in the open position of the bucket its back portion bearing on said knife cooperating with said stop element; whereas in the closed position the lip of said bucket engaging with the blade of said knife.

4,962,598

APPARATUS FOR MOUNTING IMPLEMENTS ON VEHICLES

Harold G. Woolhiser, P.O. Box 4801, S. Huron, Standish, and Victor L. Hoffman, 270 Whitefeather Rd., Pinconning, both of Mich. 48658

Filed Jun. 7, 1988, Ser. No. 203,321
Int. Cl.[5] E01H 5/04
U.S. Cl. 37—231 20 Claims



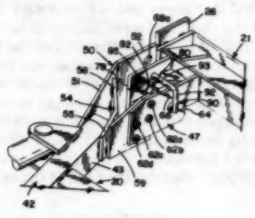
1. Apparatus for attaching an implement such as a snow plow blade to the front of a vehicle comprising an implement to extend transversely of the length of a vehicle and be operated by movement of a vehicle, a support frame for operatively attaching the implement to the vehicle, left side connection means on the rear of the implement adjacent the left end of the implement, right side connection means on the rear of the implement adjacent the right end of the implement, said support frame having a left side member extending longitudinally of the vehicle and parallel to the length of the vehicle and connected to said left side connection means, said left side connection means and said right side connection means provide for pivotal movement about substantially vertical axes between the implement and the left and right side members, said support frame having a right side member extending longitudinally of the vehicle and parallel to the length of the vehicle and connected to said right side conneciton means, said support frame including a cross beam in front of the vehicle extending between the side members, pivot means for pivotally mounting the support frame on the front end of a vehicle for pivotal movement that allows the implement to be lifted above the ground and held in such lifted position and that allows the implement to be lowered to the ground, power lift means operatively secured to the cross beam of the support frame for pivoting the frame to lift and lower the implement, rack and pinion length adjusting means for the left and right side members whereby the length adjustment of one of the side members is automatically different than that of the other of the side members to produce angling of the implement, and power angling means mounted on the cross beam of the support frame and operatively connected to the length adjusting means to adjust the lengths of the side members and produce angling of the implement.

4,962,599

QUICK CONNECT-DISCONNECT COUPLING FOR SNOW PLOW

Gary S. Harris, Sabattus, Me., assignor to DSP, Inc., Auburn, Me.

Filed Apr. 12, 1990, Ser. No. 507,917
Int. Cl.[5] E01H 5/04, 5/06
U.S. Cl. 37—266 12 Claims



1. A quick connect-disconnect coupling for mounting a pushframe attached to a plow to a pushbeam attached to a vehicle, said coupling comprising:
(a) said pushframe having a forward end mounted to a moldboard of said plow and a rearward end having a pair of laterally spaced positioning ear means for coupling and uncoupling said frame to said beam, each of said ear means including a hitch ear plate and laterally spaced therefrom a retaining ear plate, said hitch ear plate having a forward end affixed to said pushframe and a rearward end having a rearward edge surface defined by a gathering surface terminating in a generally centrally positioned, semi-circular, pin locating surface; said retaining plate having a forward end affixed to said pushframe and a rearward end with a generally circular hitch pin opening extending therethrough, said semi-circular locating surface aligned with said circular opening;
(b) said pushbeam having a pair of laterally spaced pin means for being coupled to and uncoupled from said ear means,

each pin means including an inboard mounting bracket, an outboard mounting bracket and an intermediate bracket therebetween, each bracket having a generally circular opening extending therethrough with all bracket openings aligned with one another; a hitch pin; two position spring means associated with said hitch pin operable to position said hitch pin from an uncoupled position whereat said pin is journaled only in said inboard and intermediate brackets with one of its end generally flush with said intermediate bracket to a coupled position whereat said hitch pin extends through and is journaled in all said openings in said brackets;

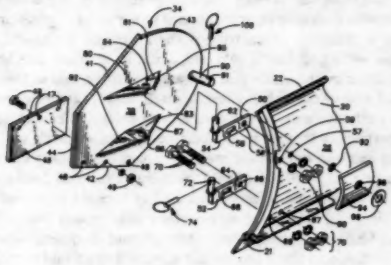
(c) said ear means and said pin means cooperating with one another to accurately position said retaining plate between said outboard and said intermediate brackets when said semi-circular pin locating surface contacts said hinge pin on the side of said inboard bracket opposite to that side thereof facing said intermediate bracket when said spring means is in said uncoupled position and to permit said hitch pin to extend through said circular opening of said retaining ear plate when said spring means is in said coupled position so that said pushframe is connected in or from pin connector to said pushbeam.

4,962,600

WING ASSEMBLY FOR USE WITH A PLOW BLADE

Dennis D. Zellaha, 430b S. Zinnia, Morrison, Colo. 80465, and David L. Bacon, 932 S. Logan, Denver, Colo. 80209

Filed Sep. 8, 1989, Ser. No. 404,740
Int. Cl.[5] E01H *5/06*
U.S. Cl. 37—280 **23 Claims**



1. A wing assembly adapted to be mounted on a plow blade having a plowing surface bounded by a lower edge, an upper edge and a pair of side edges whereby said plow blade has an effective plowing width between said pair of side edges, said plow blade adapted to be mounted to and driven by a vehicle in a direction of travel, said wing assembly operative to increase said effective plowing width and comprising:

a wing plate having a front surface defining an auxillary plowing surface bounded by an upper wing edge, a lower wing edge, an inboard wing edge and an outboard wing edge, said wing plate having a rear surface opposite said front surface;

hinge means attached to a selected one of said side edges of said plow blade for defining an upright pivot axis proximate said side edges;

mounting means on said wing plate for engaging said hinge means along the pivot axis, said mounting means being located centrally of said wing plate, and for releasably securing said wing plate to said plow blade along the selected one of said side edges so that an inboard portion of said wing plate overlays a portion of the front plowing surface of said plow blade, said wing plate being pivotable about said pivot axis so that said wing plate can move to an attack position wherein the inboard edge thereof is proximate said plow blade; and

releasable locking means for securing said wing plate in the attack position.

4,962,601

DRAINAGE GUIDE FOR AUTOMOBILE WINDOW

Peter N. Gold, 465 North Wood Rd., Rockville Centre, N.Y. 11570

Filed Oct. 11, 1989, Ser. No. 419,888
Int. Cl.[5] E05F *11/38*
U.S. Cl. 49—374 **9 Claims**

1. A drainage guide for a vehicle window panel positioned for vertical movement within a door of the vehicle, said vehicle door having a belt line seal, comprising:

a vehicle glass window panel;

a water drip gutter adhesively afffixed to said window panel outside outside window surface for guttering water that collects and passes below the belt line sill of a vehicle door cavity, within said cavity for the useful function of directing the movement of said water to a lower corner of the window panel;

said gutter comprises an elastomeric material extruded onto aid outside window surface;

said elastomeric material being extruded onto said outside window surface and being applied prior to said glass panel being installed into said vehicle door cavity or said elastomeric material extruded onto said outside surface after said window panel has been installed into said vehicle door cavity;

mounting means attached to said vehicle window panel for positioning said window panel during vertical movement; and

said gutter being affixed to said window panel at a position below said belt sill and above said mounting means said gutter being independent from any means for mounting the glass window panel within the vehicle door.

4,962,602

STICKER FOR ALARM SYSTEM

Ralph S. Meyrowitsch, Birkehaven 112, DK-2980 Kokkedal, Denmark

PCT No. PCT/DK87/00120, § 371 Date Jun. 3, 1988, § 102(e) Date Jun. 3, 1988, PCT Pub. No. WO88/02525, PCT Pub. Date Apr. 7, 1988
PCT Filed Oct. 5, 1987, Ser. No. 204,700
Claims priority, application Denmark, Oct. 3, 1986, 4733/86
Int. Cl.[5] G09F *13/00*
U.S. Cl. 40—541 **6 Claims**

1. A label connectable to an alarm system comprising:

a first sheet, having a means for mounting said first sheet on a light transmitting surface so that a warning sign on said label is visible through said surface; and

a second sheet fixed to said first sheet so that at least one light emitting diode is positioned between said first and

second sheets to project the light from the diode through said light transmitting surface and illuminate said label.

4,962,603

QUICK-ALIGNING, LASER-PRINTABLE INDEX TABS

Kim Y. Kao, Alhambra, and Stephanie A. Streeter, Pacific Palisades, both of Calif., assignors to Avery International Corporation, Pasadena, Calif.

Filed Apr. 28, 1989, Ser. No. 345,086
Int. Cl.[5] G09F 3/00
U.S. Cl. 40—641 6 Claims

1. An index tab for mounting on a sheet member, said sheet member provided with keying means comprising a protrusion of said sheet member, said index tab comprising:

a mainly planar rectangular base sheet;

a first side of the base sheet comprising a non-adhesive printing surface;

a second side of the base sheet including an adhesive coating;

a rectangular non-adhesive region disposed centrally on the second side having edges parallel to the corresponding edges of said base sheet;

said adhesive coating surrounding said non-adhesive region said second side of the base sheet forming an adhesive-free pocket for receiving and guiding the keying means when the base sheet is folded about an intermediate fold line for mounting on the sheet member;

said intermediate fold/score line dividing the base sheet into an upper portion and a lower portion and mainly bisecting the non-adhesive region into an upper section and a lower section;

said upper and lower portions being disposed on either side of the sheet member when the base sheet is in a mounted position folded about the intermediate fold/score line;

said upper and lower section of the non-adhesive region enclosing the protrusion when the base sheet is in the mounted position; and

said base sheet including an outer fold/score line extending parallel to the intermediate fold/score line and dividing said upper section into a first and a second region; whereby,

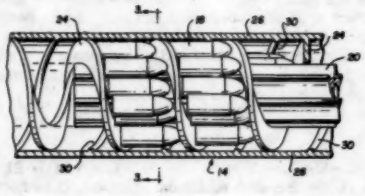
in an intermediate mounting position, said upper and lower sections of the non-adhesive region are located adjacent to and face each other, and said first region is folded out of alignment with said second region about said outer fold/score line.

4,962,604

LARGE CAPACITY AMMUNITION MAGAZINE

Michael K. Miller, and Warren D. Stockton, both of 405 E. 19th St., Bakersfield, Calif. 93305

Division of Ser. No. 260,052, Oct. 20, 1988, Pat. No. 4,888,898.
This application Aug. 11, 1989, Ser. No. 395,580
Int. Cl.[5] F41C 25/10, 23/00
U.S. Cl. 42—49.01 1 Claim



1. A removable ammunition magazine for a gun, said magazine being of an elongated, generally cylindrical configuration, said magazine comprising means to permit said magazine to be removably operably coupled to said gun, means to position and drive a plurality of cartridges therethrough with said cartridges arranged inside said magazine in at least one helical row, drive means inside said magazine to drive said at least one helical row of cartridges therethrough, said magazine comprising a cartridge exit, feed means at said cartridge exit to permit the cartridges therein to be fed one by one through said cartridge exit and out of said magazine, said feed means comprising a pair of feed lips at said cartridge exit, said feed means further comprising a feed blocking bar located in one of said feed lips, and spring means normally urging said bar into the path of exit of cartridges out through said feed lips; whereby said feed lips and said bar permit normal exit of said cartridges one by one longitudinally out of said magazine and also permit, upon retraction of said bar against said spring means out of said path, rapid unrestricted exit or entry of a succession of cartridges through said feed lips.

4,962,605

FIREARM PROVIDED WITH AN IMPROVED TRIGGER MECHANISM

Friedrich Aigner, St. Valentin, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Jan. 30, 1990, Ser. No. 472,594
Claims priority, application Austria, Jan. 31, 1989, 185/89
Int. Cl.[5] F41A 17/48, 19/10
U.S. Cl. 42—69.01 2 Claims

1. In a firearm comprising

a receiver and

a trigger mechanism,

wherein said trigger mechanism comprises

a trigger rod

spring means biasing said trigger rod forwardly,

a trigger, which is operable rearwardly from an initial position to move said trigger rod rearwardly against the force of said spring means, and

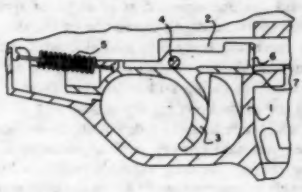
locking means for locking said trigger rod when said trigger rod is in said initial position,

the improvement residing in that

said trigger rod is slidably mounted and guided in said receiver for a movement along a straight line,

said trigger is directly pivoted to said trigger rod for a limited pivotal movement and is provided with a nose,

said receiver is formed with a notch, which is arranged to receive said nose when said trigger is in said initial position and



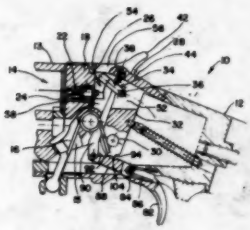
said spring means comprise a spring, which biases said trigger for a forward pivotal movement and which exerts on said trigger rod a forward tensile force and is arranged to hold said nose in said notch when said trigger is in said initial position.

4,962,606

HAMMER SAFETY FOR FIREARMS

Oscar A. Ponzi, Sao Leo Poldo/rs, Brazil, assignor to Amadeo Rossi S.A., Sao Leopoldo, Brazil

Filed Jun. 29, 1989, Ser. No. 373,225
Claims priority, application Brazil, Jul. 1, 1988, PI88-03286
Int. Cl.[5] F41A *17/74*
U.S. Cl. 42—70.08 12 Claims



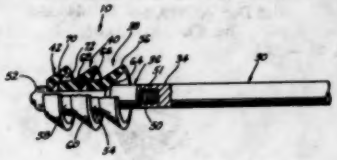
1. A hammer safety for a firearm comprising, a hammer movable from a rearward position to a forward position, a striker, means mounting said striker on said hammer for movement between a lower active impact delivering firing position and an upper inactive non firing position, said striker being normally in said active position, trigger means for releasing said hammer from said rearward position in response to a pull on said trigger means, spring means for normally maintaining said trigger means in a relessed position, striker engaging safety means movable to an operative position in the path of travel of said striker when the trigger means is released for engaging and moving said striker to said upper inactive non firing position before the hammer moves to said forward position so the firearm will not fire, said striker engaging safety means being movable to an inoperative position out of the path of travel of the striker in response to pulling said trigger means so that the striker remains in said lower active firing position to discharge the firearm when the trigger means is intentional pulled.

4,962,607

BORE CLEANING TOOL

Leon M. Baldwin, P.O. Box 711, Selling, Okla. 73663

Filed Sep. 7, 1989, Ser. No. 404,116
Int. Cl.[5] F41A *29/02*
U.S. Cl. 42—95 9 Claims



1. A bore cleaning tool for cleaning the internal surface defining a bore, comprising:

a support shaft having a diameter less than the diameter of the bore so that the support shaft can freely travel therethrough;

skirt means supported on the support shaft for engaging the internal surface of the bore; the skirt means comprising:

at least one resilient skirt member supported on the support shaft, the skirt member having a cylindrically shaped forward portion and a hollow frusto-conically shaped rearward portion; and

a resilient nose member abuttingly engaging the cylindrically shaped forward portion of an adjacent disposed skirt member, the nose member comprising a frusto-conically shaped member substantially equal in diameter to the diameter of the frusto-conically shaped rearward portion of the skirt member; and

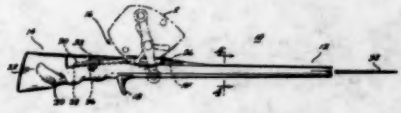
retainer means for securing the skirt means on the support shaft, the skirt means compressingly engaging the internal surface along the length of the bore as the support shaft is caused to move through the bore.

4,962,608

FISHING ROD

Gary A. Loomis, P.O. Box 907, Woodland, Wash. 98674, and Allan W. Jackson, 975 Cardon Dr., Rockledge, Fla. 32955

Filed Dec. 27, 1988, Ser. No. 290,446
Int. Cl.[5] A01K *87/00*
U.S. Cl. 43—18.1 15 Claims



1. A fishing rod assembly comprising a hollow rod blank having a tip end and a butt end, the rod blank comprising top and bottom walls interconnected by sloped side walls sized to define a substantially trapezoidal cross section, whereby when a force is applied to the tip of the blank in the downward direction, the ability of the rod blank to accommodate the

resulting tensile load along the top wall is substantially equivalent to the ability to accommodate the resulting compressive load along the bottom wall.

4,962,609

FISH ATTRACTANT SCENTED FISHING LURE

Russell D. Walker, Box 1502, Enid, Okla. 73702

Filed Dec. 4, 1989, Ser. No. 445,252

Int. Cl.[5] A01K *85.01*

U.S. Cl. 43—42.06 **1 Claim**

1. A fishing lure, comprising:

a fish imitating body shape characterized by a forward and downwardly projecting spoon-like fin,

each side surface of the fish-shaped body having a single recess encompassing the major side surface area of the respective side of the fish-shaped body;

a layer of natural or synthetic fibrous material filling the recess,

said fibrous material having fibers capable of absorbing and temporarialy retaining fish attractant substance, whereby when said absorbant fibrous material is impregnated with fish attractant and drawn through prospective fishing waters the fish attractant material is gradually displaced by water while simultaneously dispersing the fish attractant, and,

at least one fishhook attached to said fish-shaped body.

4,962,610

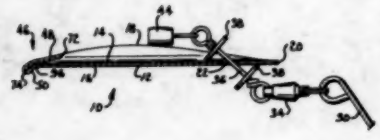
METHOD OF CONSTRUCTING A FISHING LURE BLADE AND BLADE CONSTUCTED THEREBY

Richard J. Bleam, Springfield, Mo.; Ronald C. Keller, and David N. Keller, both of Fort Smith, Ark., assignors to Bass Pro Shops, Inc., Springfield, Mo.

Filed Mar. 31, 1989, Ser. No. 331,504

Int. Cl.[5] A01K *85/00*

U.S. Cl. 43—42.53 **4 Claims**



1. A method of constructing a fishing lure blade from a blade body having opposing convex and concave surfaces and opposite end portions each terminating in a curved tip, said method comprising the steps of:

providing a first tool having a groove with a size and shape to closely receive one end portion of the blade body therein and a preselected depth measured from an edge of the first tool located adjacent to the groove;

inserting said one end portion of the blade body in said groove to the full depth thereof with the concave surface of the blade body against said edge of the first tool;

bending the blade body about said edge while said one end portion remains in the groove to effect a bend of the blade body along a bend line substantially coincident with said edge, thereby forming a flap on said one end portion of the blade;

bending said flap about said bend line until the tip of said one end portion is adjacent the concave surface of the blade body;

providing a second tool having a slot with a width to receive the tab and blade body therein and a preselected depth, said second tool presenting an inclined surface spaced from said slot and oriented at an angle of approximately 45° relative to the depth dimension of the slot;

inserting the blade body into said slot with the bend line entering the slot to the full depth thereof and with said convex surface facing said inclined surface;

clamping the blade body rigidly in said slot;

bending said blade body in a direction toward said inclined surface until said convex surface contacts said inclined surface, thereby forming a double thickness lip extending at an angle of approximately 45° to the convex surface and having a junction line with the blade body spaced from said bend line a distance equal to said preselected depth of the slot; and

bending said tab toward said concave surface until the curved tip of said one end portion is spaced away from said concave surface by a preselected distance.

4,962,611

PORTABLE ELECTRONIC INSECT CONTROLLER

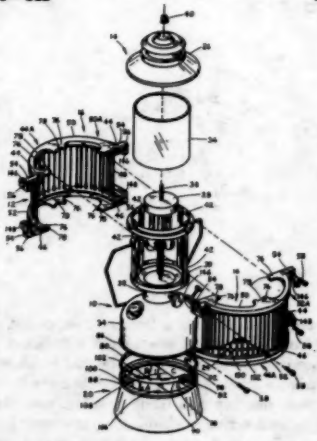
Lance L. Millard, 2820 E. 36th Ct., Des Moines, Iowa 50317

Continuation-in-part of Ser. No. 498,925, May 26, 1983, Pat. No. 4,603,505. This application Nov. 22, 1988, Ser. No. 274,974

The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.

Int. Cl.[5] A01M *1/22*

U.S. Cl. 43—112 **23 Claims**



16. A portable electronic insect controller, comprising,

an electrically conductive grid means being alternately polarized with electricity in association with a light producing lantern for electrocuting insects when they pass near the electrically charged grid means;

a power supply means for supplying a controlled source of electrical energy to the grid means;

said grid means further including a bracket, said bracket engaging the grid means to the lantern;

a housing means connected to the lantern for the storage of power supply equipment.

4,962,612

DECORATIVE PANEL AS CONSTRUCTION MATERIAL

Tomonori Kuwano, Chiba, and Kazutoshi Omoda, Tokyo, both of Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

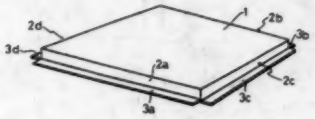
PCT No. PCT/JP88/00398, § 371 Date Dec. 23, 1988, § 102(e) Date Dec. 23, 1988, PCT Pub. No. WO88/08473, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 22, 1988, Ser. No. 337,765

Claims priority, application Japan, Apr. 23, 1987, 62-100296

Int. Cl.[5] E04B *1/38*; B27K *1/00*

U.S. Cl. 52—506 8 Claims



1. A decorative panel as a construction material for use in decorative finish of a building by covering surfaces of walls, pillars, ceilings, floors, doors, handrails, screens and other like parts of the interior and exterior of the building, said panel comprising a sheet of stainless steel as a substrate and a colored coat on at least one surface of said substrate and having one or more bent portions where the entire thickness of said substrate and colored coat is unitarily bent at an angle of at least 90°, wherein said colored coat has a thickness of not more than 5 μm and consists essentially of from 30 to 60 atomic % of titanium, from 30 to 60 atomic % of aluminum and such an amount of nitrogen that a ratio N (atomic %)/[Ti (atomic %)+ Al (atomic %)] is within the range between 0.6 and 1.0, the total sum of the Ti (atomic %), Al (atomic %) and N (atomic %) being substantially 100; and said colored coat is applied onto the surface of said substrate by a sputter ion plating process, whereby nitrides of titanium and aluminum are entirely consistently formed to constitute said colored coat.

4,962,613

PLANT GROWING SYSTEM

A. Eugene Nalbandian, 1741 Brookdale, La Habra, Calif. 90631

Continuation-in-part of Ser. No. 231,873, Aug. 12, 1988. This application Jan. 12, 1990, Ser. No. 464,330

Int. Cl.[5] A01G *25/00*

U.S. Cl. 47—79 31 Claims

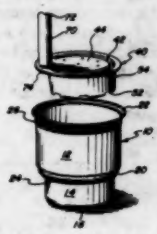
1. An apparatus for growing plants in which the plant is potted in a container partially filled with a porous soil mix wherein the plant draws water from a water reservoir to the plant's roots by both capillary action through voids in the soil and by direct upward flow from the reservoir but preventing the possibility of oversaturation and where the soil and roots are able to be surrounded by oxygen and the plant foliage by humidity to provide the most beneficial environment for the plant's growth and well being, said apparatus comprising:

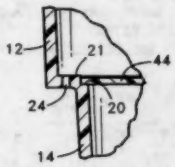
a portable open container, having a base, an upper portion, a lower portion, and a plurality of container holes above said lower portion so that said container can hold water in the lower portion;

a platform positioned within said container for resting the soil thereon an capable of supporting the soil above the reservoir, said platform having a plurality of platform holes to allow for the passage of water and oxygen and being at a vertical level proximate to that of the container holes so that the container holes are unobstructed by said platform to allow oxygen to pass directly to the soil from outside said container and so that water cannot remain above said platform after filling the lower portion of said container;

a trough in said platform having two side walls and a floor extending between said side walls, said floor having a plurality of trough holes to allow the water to rise into said trough and periodically saturate the soil contained therein; and

a watering tube having a first end proximate said platform and a second end proximate the upper edge of said container so oxygen can travel theretrhough to the water





reservoir so that a user can introduce water through said watering tube to fill the lower portion of said container, said apparatus allowing any excess water to flow out through the container holes, and providing the plant oxygen through the container holes and platform holes and water through the trough holes.

4,962,614

PERFORATED PLANT VESSEL FOR EPIPHYTES

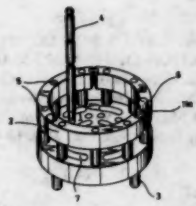
Hans Koerper, Geretsried, Fed. Rep. of Germany, assignor to Vivaria GmbH, Import von Pflanzen und Tieren, Fed. Rep. of Germany

Filed Oct. 6, 1988, Ser. No. 255,132

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1987, 3734074; Aug. 12, 1988, 8810282[U]

Int. Cl.[5] A01G *9/02*

U.S. Cl. 47—66 13 Claims



1. A perforated plant vessel of plastic material for holding epiphytes or similar plants, which, in natural surroundings, grow without any soil on other plants or stones; said vessel comprising at least one base, said base comprising a base plate with insertion openings, apertures adapted to receive plant roots and holes; at least one support rod insertable into said holes; lateral, horizontally extending strip-like wall segments of approximately the shape of a strip being arranged at the

periphery of the base plate and corresponding to the shape of said base plate, said lateral wall segments having first and second longitudinal edges, the first of the longitudinal edges of said lateral wall segments having insertion projections which coincide with insertion openings in the base plate, the second of said longitudinal edges of the lateral wall segments having insertion openings for the receipt of insertion projections of additional lateral wall segments, each insertion projection of each wall segment including a section having a diameter comparatively larger than the diameter of the insertion openings which serves to space said wall segment from said base or from an adjacent wall segment.

4,962,615

WINDOWS AND DOORS

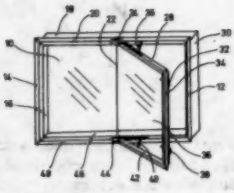
Ian A. Birdling, Upper Hutt, New Zealand, assignor to Birdling Industries Limited, Upper Hutt, New Zealand

Filed Sep. 29, 1987, Ser. No. 102,427

Claims priority, application New Zealand, Sep. 29, 1986, 217713; Oct. 10, 1986, 217889

Int. Cl.[5] E05D *11/00*

U.S. Cl. 49—381 **7 Claims**



1. In a window or door assembly the combination comprising a fixed panel, a pivotal pane of a translucent material, hinge means between the panel and the pane, the panel and the pane having adjacent edges defining a hinge line therebetween, an elongate bead of polymeric sealing material bonded to each of said edges to form a seal therebetween which flexes during movement of the pivotal pane and is able to withstand repeated flexing, the pane and panel having respective frame members at opposite ends of the bead and the hinge means having hinges connecting the respective frame members.

4,962,616

METHOD AND DEVICE FOR CONTROLLING THE OPERATION OF HONING MACHINES

Gerhard Wittstock, Uetersen, Fed. Rep. of Germany, assignor to Peter Wolters AG, Rendsburg, Fed. Rep. of Germany

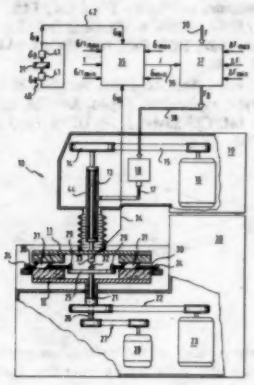
Filed May 22, 1989, Ser. No. 355,030

Claims priority, application Fed. Rep. of Germany, May 28, 1988, 3818159

Int. Cl.[5] B24B *49/05*

U.S. Cl. 51—165.71 **31 Claims**

1. A method for controlling the operation of a two-wheel honing machine wherein the machining wheels are pressed towards each other and onto the workpieces at a predetermined variable loading pressure by means of a loading device, wherein during operation the material removal of the workpieces and eventually of the machining wheels is determined by means of a measuring control device and the operation is discontinued after a predetermined value has been reached, characterized in that the thickness of material removal per time unit (actual value) is determined and compared with at least one predetermined value for the thickness of material removal per time unit and the loading pressure of the loading device is



automatically increased when the actual value is below the predetermined value.

4,962,617

PORTABLE HANDHELD POWER-DRIVEN TOOL

Benno Tilders, Waiblingen, and Michael Leuchte, Stuttgart, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed May 14, 1990, Ser. No. 522,783

Claims priority, application Fed. Rep. of Germany, May 20, 1989, 3916433

Int. Cl.[5] B24B *23/02*

U.S. Cl. 51—170 PT **6 Claims**

1. A portable handheld power-driven tool for driving a work tool, the power-driven tool comprising:

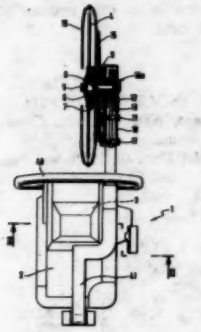
a housing;

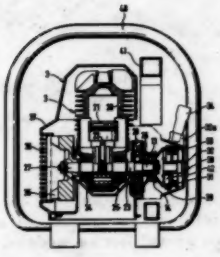
an internal combustion engine mounted in said housing and having a drive shaft which is rotatably driven;

said drive shaft having first and second ends extending from respective sides of said engine;

a drive wheel mounted on said first end for driving the work tool;

a fan wheel mounted on said second end for generating a flow of air for cooling said engine; and,





a starter device mounted at said first end of said drive shaft for acting on said drive shaft for starting the engine.

4,962,618

LENS LAPPING PAD

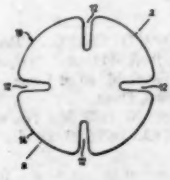
Stephen J. Wylde, Surrey, England, assignor to J & S Wylde, Ltd., Surrey, England

Continuation of Ser. No. 133,380, Dec. 15, 1987, abandoned. This application Jan. 19, 1990, Ser. No. 467,182

Claims priority, application United Kingdom, Dec. 16, 1986, 8630049

Int. Cl.[5] B24D *11/02*

U.S. Cl. 51—395 **17 Claims**



1. A lens lapping pad comprising a metal foil having a thickness substantially in the range from 0.07 mm to 0.13 mm, and a tool-adherable backing of cloth impregnated with a pressure sensitive adhesive, to give an overall pad thickness substantially in the range from 0.35 mm to 0.60 mm, in which the cloth has one of its sides firmly attached to the metal foil by means of adhesive, and in which pressure sensitive adhesive is present on the other side of the cloth, being the side further from the metal foil, by means of which the pad may be removably attached to the working surface of a lens lapping tool with the cloth between the tool and the metal foil, and in which the pad is continuous across at least one diameter thereof, being substantially equal to the diameter of the working surface of a lens lapping tool.

4,962,619

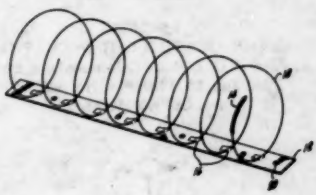
APPARATUS FOR DETERRING BIRDS

Victor H. Chatten, 1567 W. 215th St., Torrance, Calif. 90501

Filed Feb. 16, 1989, Ser. No. 311,725

Int. Cl.[5] E04H *9/16*

U.S. Cl. 52—101 **8 Claims**



1. In an apparatus for deterring birds from landing on a perch location, the apparatus having a coiled wire, said wire being of sufficiently light gauge so as not to stably support the weight of the bird to be deterred, but of sufficiently heavy gauge and the individual spirals being of proper size and spacing so as to interfere with the bird's ability to comfortably close it wings, causing it to take flight, the improvement comprising an elongate strip having flaps punched therein at locations consistent with the desired coil spacing, said flaps being bent and crimped over the wire to hold it in position while allowing the wire to rotate, said strip being attachable to the perch location.

4,962,620

GUY MARKER CONSTRUCTION

Henry Mastalski, Orange Park, Fla., assignor to Florida Wire and Cable Company, Jacksonville, Fla.

Filed Mar. 14, 1990, Ser. No. 493,421

Int. Cl.[5] E04H *12/20*

U.S. Cl. 52—147 **13 Claims**

1. A guy marker assembly comprising, in combination:

a mounting body with a longitudinal axis and opposite end portions thereon, said body having a recess extending along the full length thereof, dimensioned to receive a guy cable therewithin disposed substantially on said axis, and

having a groove extending entirely thereabout between said end portions and generally in a plane perpendicular to said axis thereof;

means for attaching said mounting body to a guy cable so disposed; and

a tubular marker member coaxially mounted on said body and dimensioned and configured for rotation thereabout, said marker member having at least one inwardly projecting engagement element thereon slidably seated within said groove of said body, said engagement element engaging said marker member and body against relative axial displacement while permitting relative rotation therebetween.

4,962,621

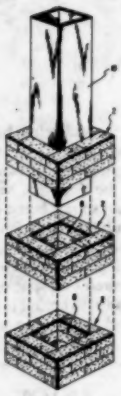
MODULAR BRICK CHIMNEY UNIT

Michael A. Pura, R.D. 1, Box 91, Johnsonburg, Pa. 15845

Filed Jan. 13, 1989, Ser. No. 365,855

Int. Cl.[5] E04H *12/28*

U.S. Cl. 52—218 **6 Claims**



1. A prefabricated modular chimney unit comprising a plurality of courses of joined bricks forming a closed shape and having channel means therethrough for receiving a section of chimney flue liner.

4,962,622

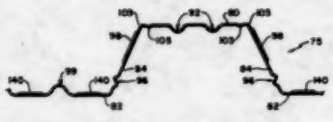
PROFILED SHEET METAL BUILDING UNIT AND METHOD FOR MAKING THE SAME

Raymond E. Albrecht, Sewickley, and Charles R. Gray, Aliquippa, both of Pa., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Filed Jan. 1, 1989, Ser. No. 359,585

Int. Cl.[5] E04C *2/32*

U.S. Cl. 52—630 **6 Claims**



1. In a profiled building unit formed from sheet metal having a substantially uniform sheet thickness and presenting alternating crests and valleys, and sloped webs connecting adjacent ones of said crests and said valleys, the improvement comprising:

first and second stiffening ribs formed, respectively, in said crests and said valleys, said stiffening ribs extending longitudinally along substantially the entire length of said building unit and each having a substantially uniform rib thickness that is less than said uniform sheet thickness of said metal sheet.

4,962,623

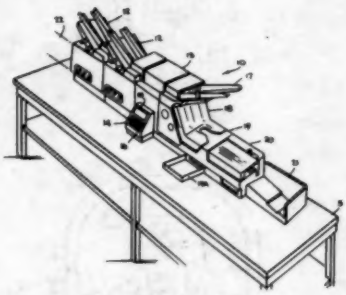
ASYNCHRONOUS REJECTION IN AN INSERTER

Robert Francisco, New Fairfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 30, 1988, Ser. No. 292,157

Int. Cl.[5] B65B *5/06, 57/14*

U.S. Cl. 53—54 **24 Claims**



1. A material processing system for collating and feeding documents as collations for insertion into an envelope, comprising first and second feeding modules, and an insertion module,

each of said feeding modules including document position sensing means and a controller,

each of said feeding module controllers responsive to a first signal for creating a collation of documents and generating a second signal indicative of said collation, said second signal indicating an error condition in said collation when said sensors indicate non compliance with said first signal,

means for passing said second signal from each feeding module controller to said insertion module,

a rejection station positioned in said insertion module, said insertion module including a base controller, said base controller connected to said feeding module controllers and responsive to a collation error condition in said second signal for activating said reject station and rejecting said collation.

4,962,624

ENVELOPE OPENING APPARATUS

Dean H. Foster, Stratford; William J. Wright, Killingworth, and Richard E. Kish, Fairfield, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 20, 1989, Ser. No. 453,750

Int. Cl.[5] B65B *43/39, 43/12*

U.S. Cl. 53—76 **18 Claims**

1. In a machine including means for feeding an unsealed envelope downstream in a path of travel, the envelope having a body portion and a flap portion folded in overlying relationship with the body portion and having a free edge, apparatus for unfolding the flap portion comprising:

a. a first guide member extending parallel to the path of travel;

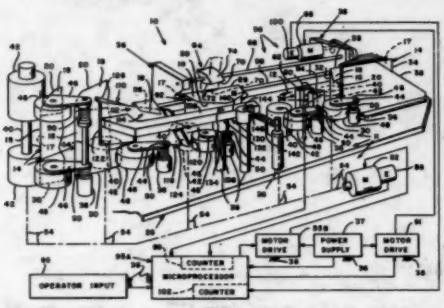
b. a finger member rotatable into engagement with the flap portion for bending the body portion against the first guide member to form a gap between the flap portion and body portion;

c. a second guide member extending into the path of travel

for engaging an envelope fed thereto downstream of the finger member;

d. means for sensing an envelope in the path of travel;

e. means responsive to the sensing means for causing the finger member to rotate into engagement with the flap portion when the envelope is fed downstream in the path of travel; and



f. the second guide member dimensioned for entry into the gap and progressively moving the free edge of the flap portion away from the body portion when the feeding means feeds the envelope into engagement with the second guide member.

4,962,625

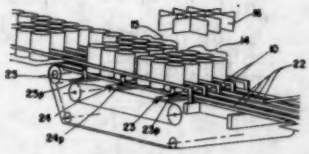
CONTAINER PACKING MACHINES

A. David Johnson, Jr., and Joseph L. Bachman, Jr., both of Wayne, Pa., assignors to Wayne Automation Corporation, Norristown, Pa.

Continuation of Ser. No. 272,930, Nov. 18, 1988, abandoned, which is a continuation of Ser. No. 193,772, May 13, 1988, abandoned, which is a continuation of Ser. No. 43,614, Apr. 28, 1987, abandoned. This application Jun. 6, 1989, Ser. No. 362,310

Int. Cl.[5] B65B *35/44, 21/06*

U.S. Cl. 53—157 **3 Claims**



1. In a container-packing machine having main frame means, means on the main frame to accept a supply of containers and direct the containers along an axis together with insert means to receive groups of containers and to insert partition means between containers in a group:

a plurality of independent lane-guide means each alternatively mountable as a unit on said main frame means and removable as a unit from said main frame means, each lane guide means, when mounted on the frame means, to receive containers from said supply and segregate the containers into adjacent spaced-apart lanes and each of the independent lane guide means when mounted on said main frame means effecting different spacing between the lanes for use in accomodating different diameter containers;

means on said main frame forming a main frame opening below the lane guide means installed on the machine;

a plurality of independent belt assemblies each alternatively mountable as a unit within said main frame opening and removable as a unit from the frame opening and each having a plurality of belt means which, when the belt assembly is mounted on the machine, respectively extend along the lanes formed by the lane guide means which is installed on the machine, the belts being for use in moving containers toward said insert means and each independent belt assembly having a grouper pin opening and predetermined spacing between the belt means;

a plurality of independent pin assemblies each alternatively mountable as a unit within the grouper pin opening in any of said belt assemblies and removable as a unit from the grouper pin opening and each pin assembly having a plurality of spaced apart sets of grouper pins each set a plurality of spaced apart grouper pins thereon and when a pin assembly is so mounted, the pins of each set being adapted to respectively engage containers in the lanes and separate the containers into rows normal to the lanes and also to engage containers to separate the containers into groups of containers for said belts to deliver the groups to said insert means and each of the pin assemblies having predetermined spacing between its said sets and predetermined spacing between its said pins; and

predetermined combinations (a) of a lane guide means, (b) of a belt assembly, and (c) of a pin assembly being selectable for mounting on the machine to provide for a preselected number of containers in the groups to be moved to the insert means for the insertion of a partition; and

first track means on said main frame adjacent said main frame opening and extending normal to said axis;

on each of said belt assemblies, roller means for engaging said first track means and providing for moving its belt assembly into and out of the main frame opening, the first track means and the respective belt assembly roller means providing for said mounting of any of said belt assemblies within said main frame opening and for said removal therefrom;

on each of said belt assemblies, second track means adjacent the grouper pin opening thereof and extending normal to said axis when the belt assembly is mounted in the main frame opening; and

on each of said pin assemblies, roller means for engaging said second track means and providing for moving its pin assembly into and out of the grouper pin opening, the second track means and the respective pin assembly roller means providing for said mounting of any of said pin assemblies within the grouper pin opening and for said removal therefrom.

4,962,626

METHOD FOR COMPACTING A POWDER-BASED COSMETIC MATERIAL

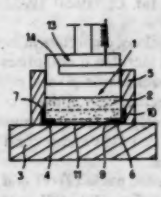
Jean-Louis Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Sep. 26, 1988, Ser. No. 248,627

Claims priority, application France, Sep. 29, 1987, 87-13424

Int. Cl.[5] B65B *1/24, 61/18, 63/08*

U.S. Cl. 53—412 **19 Claims**



1. A method for compacting a powder-based cosmetic preparation comprising the steps of:

providing a container having an open upper portion and also having a lower portion defined by a tray;

placing a quantity of powder-based cosmetic preparation

that includes from 2 to 15% by weight of at least one binder in the container;

heating a compacting piston and displacing the compacting piston in the container substantially perpendicular to a mean plane of a layer of the cosmetic preparation to compress the cosmetic preparation into a solid in the tray by the heated piston.

4,962,627

METHOD FOR COMPACTING A POWDER-BASED COSMETIC PREPARATION

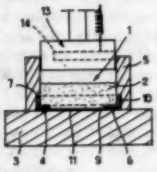
Jean-Louis Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Sep. 26, 1988, Ser. No. 248,936

Claims priority, application France, Sep. 29, 1987, 8713425

Int. Cl.[5] B65B *1/24, 63/08*

U.S. Cl. 53—412 **16 Claims**



1. A method of forming a non-viscous powder-based cosmetic preparation in a user package with the use of a tray for containing the preparation, the tray being of the type having a peripheral side wall and first and second spaced apart edges with the first edge surrounding a first opening and said second edge surrounding a second opening, the method comprising the steps of:

disposing said tray on a base plate with said first edge supported on said base plate;

filling said tray with the cosmetic preparation through said second opening including a binder from 2 to 15% by weight of the preparation; and

compacting the preparation by application of pressure through said second opening, the pressure being between 40 and 400 bars into a solid state.

4,962,628

METHOD OF PACKING CIGARETTES IN HARD FLIP-FLOP PACKS

Fulvio Boldrini, Ferrara; Giorgio Vaccari, and Antonio Gamberini, both of Bologna, all of Italy, assignors to G.D. Societa per Azioni, Bologna, Italy

Filed Nov. 29, 1989, Ser. No. 443,248

Claims priority, application Italy, Nov. 30, 1988, 3680 A/88

Int. Cl.[5] B65B *19/02*

U.S. Cl. 53—462 **5 Claims**

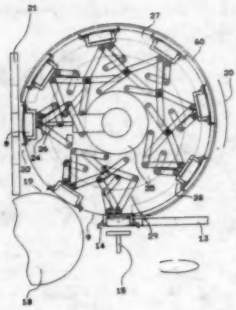
1. A method of packing cigarettes in hard flip-top packs (8), characterised by the fact that it comprises stages consisting in:

feeding flat hard pack blanks (5) and preformed groups (3) of unpacked cigarettes, the former continuously and the latter intermittently, on to a continuously rotating packing wheel (9) at a first (19) and second (14) loading station respectively; and

unloading the finished packs (8) off said packing wheel (9) at an unloading station (22), and feeding the same to an output unit (7);

said packing wheel (9) presenting a drum (27) rotating at constant angular speed, and a number of seats (35) connected to said drum (27) and each designed to receive a blank (5) and respective preformed group (3) at said first (19) and second (14) loading stations respectively; each said seat (35) being designed to move in relation to said drum (27), and being controlled in such a manner as to:

advance with said drum (27) at substantially constant angular speed through said first loading station (19); and



reverse in relation to said drum (27), at the same angular speed but in the opposite direction to the same, in said second loading station (14).

4,962,629

APPARATUS FOR THE TESTING OF CIGARETTES

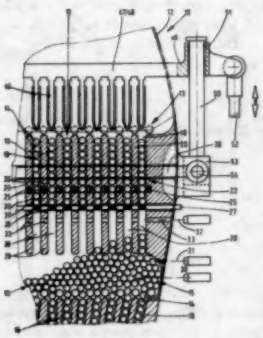
Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Apr. 13, 1989, Ser. No. 337,694

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1988, 3812689

Int. Cl.[5] B65B *1/44*

U.S. Cl. 53—498 **14 Claims**



1. An apparatus for the testing of cigarettes in conjunction with a magazine of a packaging machine, rows of cigarettes located above one another being guided through a testing unit and being tested in the region of vertical test shafts of the latter by testing members in a test zone situated in the testing unit and above a cigarette store formed by the test cigarettes, wherein straight vertical guide shafts (28) are formed as a continuation of the test shafts (18) underneath the test zone (13) and terminate above the cigarette store (15), and wherein vertical plane straight guide-shaft walls (29) limiting the guide shafts (28) are arranged in the same vertical planes as test-shaft walls (20) limiting the test shafts (18), so that tested intact cigarettes fall in an orderly and fault-free manner from said testing unit to the cigarette store.

4,962,630

ROTARY CUTTING MEMBER WITH FLEXIBLE FILAMENTS FOR USE WITH LAWNMOWERS AND THE LIKE

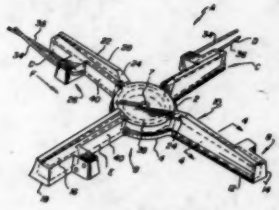
Dallas W. Jones, New Hartford, N.Y., assignor to Trim-A-Lawn Corporation, Mandeville, N.Y.

Filed May 26, 1988, Ser. No. 199,359

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[5] A01D *34/72, 34/73*

U.S. Cl. 56—12.7 11 Claims



1. An apparatus for cutting vegetation and the like, comprising:

(a) rotary cutting means having an upper surface and a lower surface;

(b) weight means embedded within said rotary cutting means;

(c) said rotary cutting means including a hub and a plurality of arm means extending from said hub;

(d) a plurality of flexible cutting means;

(e) means operably associated with each of said arm means for securing one of said cutting means thereto;

(f) said securing means including at least a first passageway having a diameter;

(g) each of said flexible cutting means having a diameter less than the diameter of said first passageway for permitting a corresponding flexible cutting means to pass through said first passageway;

(h) said weight means including a central section and a plurality of arms extending radially outwardly from said central section;

(i) said arms of said weight means corresponding in number to said arm means so that at least one of said arms is embedded in a corresponding arm means;

(j) each of said arm means including a first end lying away from said hub and a second end lying adjacent thereto;

(k) said securing means lying adjacent said first end of a corresponding arm means;

(l) each of said arms extending between said first and second ends and substantially beyond the corresponding securing means;

(m) the upper surface of at least a first one of said arm means including a first air-foil means for creating a low pressure zone above the upper surface and extending between said first and second ends thereof; and

(n) said first air-foil means comprising a planar surface inclined downwardly from said second end to said first end of said at least one of said arm means.

4,962,631

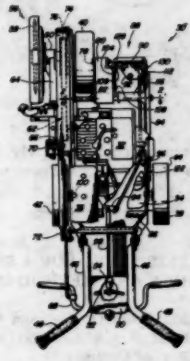
EDGER

Stephen A. Braun, Horicon; Michael J. O'Neill, Mayville; Roger W. Curry, Horicon, all of Wis.; James R. Titze, Bloomington; Donald E. Nicol, Prior Lake, both of Minn.; Tetsuzo Fujikawa, Kobe, Japan; Makizo Hirata, Hyogo, Japan, and Michio Nishimura, Kobe, Japan, assignors to Deere & Company, Moline, Ill.

Filed Sep. 7, 1989, Ser. No. 404,145

Int. Cl.[5] A01D *34/47, 34/84*

U.S. Cl. 56—17.2 21 Claims



1. An edger wherein:

a front wheel is supported on the front part of an edger frame in such a manner that the height of said front wheel can be adjusted; a cutter device is arranged at one side of said edger frame; one of the rear wheels which is situated on the other side of said edger frame is supported by said edger frame in such a manner that the height of said rear wheel can be adjusted; a front wheel height fixing set member for fixing said front wheel at a desired height position and a rear wheel height fixing set member for fixing the height adjustable rear wheel at a desired position are arranged adjacent to each other on said edger frame; at least one change lever is provided for changing these set members to wheel height setting release conditions by engaging with these set members; a single control lever is rotatably arranged on handle portions positioned at a rear portion of said edger frame; and said control lever is operatively connected to said change lever through at least one relay rod.

4,962,632

AGRICULTURAL BALER WITH MOVABLE FEEDER FLOOR

Marnix J. Schoonbeere, Ichtegem, and Roger H. Van Eecke, Blankenberge, both of Belgium, assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Apr. 25, 1989, Ser. No. 343,460

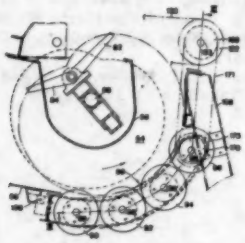
Claims priority, application United Kingdom, Apr. 28, 1988, 8810061

Int. Cl.[5] A01D *39/00*

U.S. Cl. 56—341 7 Claims

1. In an agricultural baler including a bale case having an inlet opening formed in a bottom wall thereof, a feeder duct communicating at one end with the inlet opening in the bale case, and feeder means operable to feed crop material into the feeder duct to form a wad of crop material for subsequent transfer to the bale case; an improvement comprising a lower wall of the feeder duct being provided with movable means operable to assist in the movement of crop material within the feeder duct and contactable by the crop material as it passes

through the feeder duct, whereby the frictional forces produced by the passage of the crop material over said lower wall of the feeder duct are reduced, said movable means including



a plurality of rollers extending transversely of the feeder duct and arranged side-by-side along the lower wall of the feeder duct.

4,962,633

TANGENTIAL BELT DRIVE FOR A SPINNING OR TWISTING MACHINE AND METHOD OF OPERATING SAME

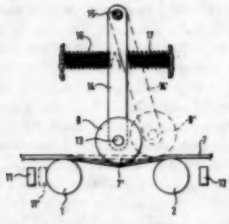
Gerd Stahlecker, 7322 Eislingen/Fils, and Klaus Hofstetter, Hochdorf, both of Fed. Rep. of Germany, assignors to Novibra GmbH, Fed. Rep. of Germany

Filed Sep. 28, 1989, Ser. No. 413,634

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1988, 3833199

Int. Cl.[5] D01H *13/00*

U.S. Cl. 57—105 **24 Claims**



1. A tangential belt driving arrangement for a plurality of textile machine spindles arranged in a row, comprising:

a tangential driving belt having a travel section extending past a plurality of spindle shafts,

a pressure roller arranged approximately in the center between two spindle shafts,

and pressure roller moving means for moving the pressure roller to deflect the tangential belt in a direction forcing the tangential belt into driving engagement with the two spindle shafts,

wherein the pressure roller means includes means for moving the pressure roller in a path substantially parallel to the travel path of the driving belt between a first position with the pressure roller forcing the driving belt with substantially equal driving force toward both of the spindle shafts and with a corresponding equal partial wrapping of the spindle shafts by the driving belt and a second position with the second roller continuing to force the driving belt with substantially unchanged driving force toward one of the pressure rollers while relieving the driving belt driving force and extent of partial wrapping at the other pressure roller, thereby permitting braking of the other pressure roller in a simple manner without interrupting the driving of the one pressure roller.

4,962,634

MACHINE FOR PACKING CIGARETTES IN HARD FLIP TOP PACKS

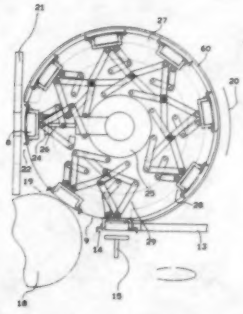
Fulvio Boldrini, Ferrara, and Antonio Gamberini, Bologna, both of Italy, assignors to G.D. Societa per Azioni, Bologna, Italy

Filed Nov. 29, 1989, Ser. No. 442,908

Claims priority, application Italy, Nov. 30, 1988, 3681 A/88

Int. Cl.[5] B65B *19/02*

U.S. Cl. 53—234 **11 Claims**



1. A machine for packing cigarettes in hard flip-top packs; said machine comprising a packing wheel; a first and second loading station and an unloading station located along the periphery of said packing wheel; a first conveyor line for successively feeding blanks on to said packing wheel through said first loading station; a second conveyor line for successively and intermittently feeding preformed groups of unpacked cigarettes on to said packing wheel through said second loading station; and an unloading line for unloading finished packs off said packing wheel through said unloading station; characterized by the fact that said first line is a continuous feed line; and that said packing wheel comprises a drum rotating, in use, at constant angular speed about its axis; a number of pockets connected to and moving with said drum, and each designed to receive a blank and respective preformed group in said first and second loading stations respectively; an articulated support located between each said pocket and said drum; and fixed cam means connected to said articulated supports for altering the configuration of the same and moving respective said pockets in relation to said drum according to the position of said articulated supports about the rotation axis of said drum; said cam means being designed in such a manner as to:

feed each said pocket together with said drum and at substantially constant angular speed through said first loading station; and

reverse each said pocket at the same angular speed but in the opposite direction to said drum in said second loading station.

4,962,635

APPARATUS FOR TRIMMING LAWNS AND THE LIKE

Dallas W. Jones, New Hartford; Lauren J. Young, Poland, and Richard P. Nadeau, Frankfort, all of N.Y., assignors to Trim-A-Lawn Corporation, Mandeville, N.Y.

Division of Ser. No. 188,508, Apr. 29, 1988, Pat. No. 4,894,980. This application Oct. 17, 1989, Ser. No. 422,768

Int. Cl.[5] A01D *34/67, 34/84*

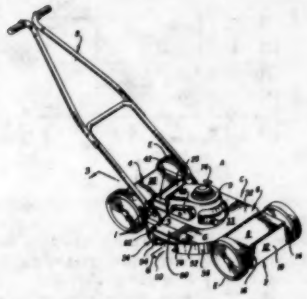
U.S. Cl. 56—12.700 **8 Claims**

1. An apparatus for trimming lawns and the like, comprising:

(a) a housing deck;

(b) a cutting blade means;

(c) at least a first front wheel and a first rear wheel;
(d) said housing deck including a cutting blade mount means for receiving said cutting blade means;
(e) said cutting blade mount means including first and second sections; and means for removably securing said second section to said first section;
(f) said first section of said cutting blade mount means including left and right sides having substantially straight edge portions;
(g) said left side edge portion extending substantially parallel to said right side edge portion;



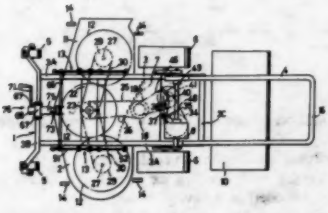
(h) said cutting blade means including at least a first flexible filament;
(i) said housing deck further including front wheel mount means for rotatably supporting said at least a first front wheel;
(j) said housing deck further including rear wheel mount means for rotatably supporting said at least a first rear wheel;
(k) the length of said housing deck along its longitudinal axis is substantially greater than the width of at least one of said front and rear wheel mount means.

4,962,636

MOWER

Keiichi Sampei; Yoshito Dei; Kazuo Furukawa; Katsumi Fukumoto, and Yoshihiro Kato, all of Osaka, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Mar. 30, 1989, Ser. No. 330,800
Claims priority, application Japan, Mar. 31, 1988, 63-80373
Int. Cl.[5] A01D *34/54*
U.S. Cl. 56—17.1 **23 Claims**



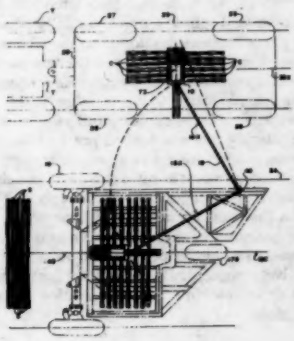
1. A mower comprising:
a cutter unit liftably mounted in a horizontal position on a side of a mower body via a pair of link mechanisms;
each of said link mechanisms including a pair of lifting links, a first end portion of said pair of lifting links being connected together so that said lifting links are rotatable upward and downward about their respective pivot points, said cutter unit being supported by respective intermediate portions of said lifting links in suspended form;
lifting control means for moving said pair of lifting links for each of said pair of link mechanisms to cause the upward and downward rotation of said lifting links;
front wheels in the forward end of said mower body and rear wheels in the rearward end of said mower body, said cutter unit being liftably mounted between said front and rear wheels; and
a driving pulley provided on a driving shaft of an engine mounted on said mower body and a driven pulley provided on an input shaft at the side of said cutter unit, said drive shaft and said driven shaft being rotatably connected by a belt member, thereby rotating cutting blades of said cutter unit;
wherein said driven pulley is rotatably supported about a vertical axis on the side of said mower body, said driven pulley including a vertical spline through-hole formed in a central portion thereof, said input shaft projecting upward from the side of said cutter unit to define a spline shaft, and wherein said spline shaft is vertically spline-fitted to shift in said spline through-hole.

4,962,637

METHOD AND APPARATUS FOR LOADING WHOLESTALK CUT SUGAR CANE WITH OFFSET BOOM AND GRAPPLE

Jacob Giardina, and Kenneth Rodrigue, both of Thibodaux, La., assignors to Cameco Industries, Inc., Thibodaux, La.

Filed Aug. 16, 1989, Ser. No. 395,012
Int. Cl.[5] A01D *55/20, 87/00*
U.S. Cl. 56—344 **22 Claims**



1. A wholestalk sugar cane loader apparatus for picking up and accumulating windrowed cane wholestalks from a cane field ground surface having heap rows and furrows comprising:
(a) a wheeled movable carriage adapted to travel along a path defined by the carriage longitudinal center axis, generally parallel to the longitudinally extending elongated heap rows with the carriage wheels trailing in parallel furrows;
(b) means, positioned adjacent the carriage for movement therewith during gathering of windrowed wholestalk cane, for accumulating wholestalk cut cane from a resting position on the cane field ground surface into a heap;
(c) the accumulating means including an elevated platform surface on the carriage for supporting cane wholestalks a distance above the ground surface;
(d) an elongated boom pivotally mounted at a rotary connection to the carriage and extending away from the rotary connection along a radial line defining a boom longitudinal axis; and

(e) a pair of opposed jaws, attached to a distal end portion of the boom opposite the rotary connection, the jaws being movable with respect to each other along a jaw travel path that allows the jaws to freely access the platform, the jaw travel path and the boom longitudinal axis being fixed during operation to intersect each other defining an acute angle therebetween.

4,962,638

MULTI-POSITION OPEN-END SPINNING MACHINE

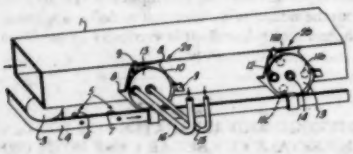
Robert Lane, Accrington, England, assignor to Hollingsworth (U.K.) Ltd., Ora, England

Continuation of Ser. No. 273,545, Nov. 21, 1988, abandoned. This application Sep. 14, 1989, Ser. No. 407,079

Claims priority, application United Kingdom, Jan. 28, 1988, 8801878

Int. Cl.[5] D01H 7/885, 11/00; A47L 5/38

U.S. Cl. 57—301 15 Claims



1. A multi-position open-end spinning machine including a plurality of open-end spinning units; a gas manifold extending along the spinning machine and serving several said spinning units; a plurality of conduits leading to the open-end spinning units; a plurality of gas valves each associated with a respective one of said open-end spinning units; mutually registering first and second gas ports to each said valve, the second port communicating with said gas manifold and the first port communicating with said conduit leading to the associated said open-end spinning unit; a rotary valve member within said valve driveable between a first angular position in which the said mutually registering first and second ports of the valve are in mutual communication and a second angular position in which said first and second ports are isolated from one another; and an endless valve-operating drive member carrying cam means comprising a first cam portion which sequentially drives the rotary valve members of the valves from said second angular position to said first angular position and a second cam portion which positively sequentially returns the valve members of said valves from said first angular position to said second angular position.

4,962,639

CHAIN LINK FOR A POWER-SUPPLY CHAIN

Günter Blase, Oberkulheim 10, D-5060 Bergisch Gladbach 2, Fed. Rep. of Germany

PCT No. PCT/DE88/00194, § 371 Date Sep. 26, 1989, § 102(e) Date Sep. 26, 1989, PCT Pub. No. WO88/07637, PCT Pub. Date Oct. 6, 1988

PCT Filed Mar. 25, 1988, Ser. No. 423,474

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1987, 3709953

Int. Cl.[5] F16G 13/16

U.S. Cl. 59—78.1 4 Claims

1. A chain link for a power-supply chain, the said chain link comprising in combination;

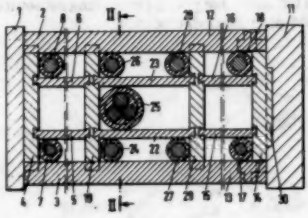
two side plates (1; 11) connected by means of transverse webs (2, 3, 12, 13) and having articulated connection means for connecting to adjacent chain links;

partition webs (4, 19, 29) for subdividing said side plates and transverse webs inserted between the transverse webs and extending perpendicularly to said transverse webs;

intermediate webs (5, 6, 22. 23) inserted between adjacent partition webs and extending perpendicularly relative to said partition webs;

wherein the partition webs (4, 19, 29) have corners, are plates, are located displaceably between the transverse webs (2,3, 12, 13), and have supporting lugs (33, 34, 35, 36) at said corners;

said supporting lugs projecting and engaging in pairs the



transverse webs and preventing their dislodgement therefrom;

said partition webs having on both sides one or more retaining grooves (37-44) distributed over their height and aligned respectively with one another and

locking lugs (54, 55) on ends of said intermediate webs (5, 6, 22, 23) which are inserted selectively into of the retaining grooves.

4,962,640

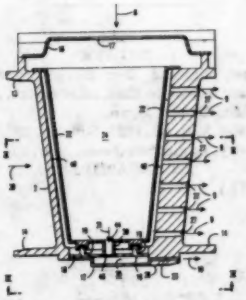
APPARATUS AND METHOD FOR COOLING A GAS TURBINE VANE

Edward W. Tobery, West Chester, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 6, 1989, Ser. No. 306,186

Int. Cl.[5] F02C 7/12

U.S. Cl. 60—39.02 18 Claims



18. A method of cooling a gas turbine vane comprising the steps of:

(a) supplying cooling air to said vane,

(b) collecting said cooling air supplied to said vane in a vessel disposed in a cavity in said vane,

(c) distributing a first portion of said cooling air throughout said cavity by flowing said cooling air through a plurality of small holes in said vessel, thereby cooling said vane,

(d) flowing said first portion of said cooling air, after said distribution throughout said cavity, through a plurality of holes connecting said cavity with an exterior surface of said vane, thereby further cooling said vane, and

(e) bleeding a second portion of said cooling air from said vessel through a large hole in said vessel, thereby removing particles entrained in said cooling air, said second

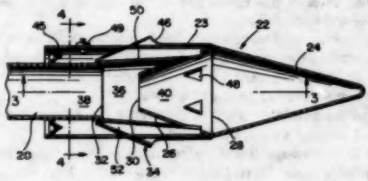
portion of said cooling air comprising 10% to 15% of said cooling air supplied to said vane.

4,962,641

PULSE JET ENGINE

John N. Ghougasian, Bronx, N.Y., assignor to Elizabeth Ghougasian, Bronx, N.Y.

Filed Feb. 28, 1989, Ser. No. 316,854
Int. Cl.[5] F07K 7/067
U.S. Cl. 60—249 18 Claims



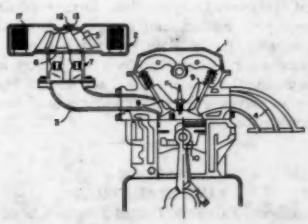
1. In a reaction thrust propulsion engine having a forward end combustion chamber section, a rear end afterbody and a resonator tube extending rearwardly from the combustion chamber section to the afterbody, a tail section operatively interconnecting the resonator tube and the afterbody, comprising passage means establishing fluid communication between the resonator tube and the afterbody for cyclically pressurizing the afterbody with combustion supporting air compressed within the resonator tube in response to generation of combustion products within the combustion chamber section, nozzle means for sequentially discharging the combustion products from the resonator tube and conducting an inflow of external reentry air to the resonator tube and ram-air intake means responsive to forward movement of the engine for regulating said pressurization of the afterbody and refill of the resonator tube by inflow of the compressed air from the pressurized afterbody and the reentry air.

4,962,642

AIR FLOW SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Sei Y. Kim, 1564-56 Shinrim 2-Dong,, Kwanak-Ku, Seoul, Rep. of Korea

Filed May 19, 1988, Ser. No. 195,888
Int. Cl.[5] F01N 7/00; F02M 29/00
U.S. Cl. 60—272 7 Claims



1. An air flow system for an internal combustion engine which comprises:

a cylindrical air cleaner, said cylindrical air cleaner divided into a centrally disposed air swirling zone and a laterally disposed filter zone, and

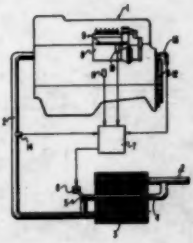
a flexible swirling device disposed in said air swirling zone, said flexible swirling device including a centrally disposed hub member provided with a pluralituy of flexible vane members which extend radially outwardly from said hub member toward the filter zone and flex in reponse to increased air flow, whereby when air is introduced through said filter zone and into said air swirling zone, a strong swirling force is generated which is retained by the reduced resistance caused by the flexible nature of the vane members.

4,962,643

SOOT-PARTICLE FILTER ARRANGEMENT FOR THE EXHAUST-LINE SYSTEM OF AN INTERNAL-COMBUSTION ENGINE

Detlef Pasten, Kerk; Jürgen Jegelka, Aichwald, and Roland Schubert, Oversth, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed May 11, 1989, Ser. No. 350,405
Claims priority, application Fed. Rep. of Germany, May 11, 1988, 3816233
Int. Cl.[5] F01N 3/02
U.S. Cl. 60—288 19 Claims



1. Soot-particle filter arrangement in the exhaust-line system of an internal-combustion engine equipped with a bypass line guiding the exhaust-gas stream past a soot-particle filter;

valve means for opening and closing said bypass line;

control means responsive to engine speed, engine temperature, engine load and exhaust line conditions for operating the bypass valve means during full load operation of the internal-combustion engine;

said control means operating said bypass valve means to open said bypass line only when said control means indicates that:

(i) the speed of the internal-combustion engine is below a first speed limit value during engine warm-up phase,

(ii) the speed of the internal-combustion engine is below a second speed limit value under hot-running engine conditions, and

(iii) with the soot-particle filter laden and the internal-combustion engine load is simultaneously below a predetermined load limit.

4,962,644

VIBRATING ROLL APPARATUS

Manfred Polacek, Munich, Fed. Rep. of Germany, assignor to Wacker Werke GmbH & Co. KG, Munich, Fed. Rep. of Germany

Filed Feb. 13, 1989, Ser. No. 310,421
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1988, 3804620
Int. Cl.[5] F16D 31/02
U.S. Cl. 60—435 1 Claim

1. A vibrating-roll apparatus, comprising:

a mounting frame;

a pair of vibratable rolls received in said mounting frame;

respective eccentric bodies received in said rolls;

a driven shaft mounted on said frame and having a driven-shaft axis parallel to axes of said rolls;

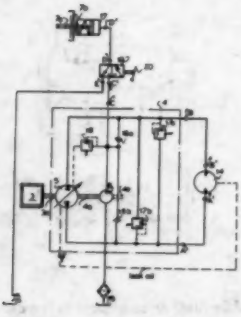
a hydraulic motor on said frame having a motor axis parallel to said driven-shaft axis;

means on said frame operatively connecting said hydraulic motor to said rolls for driving same;

means on said frame operatively coupling said driven shaft to said eccentric bodies at one end of said driven shaft for actuating said eccentric bodies to vibrate said rolls;

an engine mounted on said frame in a region of said one end and having a drive shaft with a drive-shaft axis parallel to said driven shaft axis, said engine being so positioned on said frame that a space is formed between said engine and a side of said frame in a region of an opposite end of said driven shaft;

a variable-displacement inclined-disk pump connected directly by a flange means with said engine in said space and along said drive shaft, said variable-displacement inclined-disk pump being driven directly by said drive shaft and being hydraulically connected to said motor for driving same;



a filling pump connected directly with said variable-displacement inclined-disk pump in said space and along said drive shaft, said filling pump being driven directly by said drive shaft and being hydraulically connected to said variable-displacement inclined-disk pump to supply said variable-displacement inclined-disk pump with hydraulic medium at all time during operation of said engine;

a hydraulically controlled clutch connected directly by a flange means with said filling pump in said space and along said drive shaft, said clutch being driven directly by said drive shaft and having an output element rotatable about said drive-shaft axis;

means on said frame operatively coupling said output element with said other end of said driven shaft for rotating same; and

a control valve hydraulically connected between said variable-displacement inclined-disk pump and said clutch for selectively operating said eccentric bodies.

4,962,645

FOUR CYCLE, EXTERNAL COMBUSTION, CLOSED REGENERATIVE CYCLE, PISTON ENGINE

George R. Morgan, 1831 S. Berthod Pl., Tucson, Ariz. 85710, assignor to George R. Morgan, Tucson, Ariz.

Filed Aug. 30, 1989, Ser. No. 400,801

Int. Cl.[5] F02C *1/04*

U.S. Cl. 60—682 1 Claim

1. A closed regenerative cycle engine in which a fluid is alternately expanded and compressed in a closed thermodynamic system comprising:

(a) a heater unit for heating a working fluid;

(b) a power cylinder in fluid flow communication with the heater for expanding the heated working fluid to produce work;

(c) a heater throttle valve located between the heater unit and the power cylinder for regulating the flow of working fluid from the heater to the power cylinder;

(d) a first intake valve associated with the power cylinder for controlling the admission of working fluid flowing from the heater unit under the influence of the heater throttle valve;

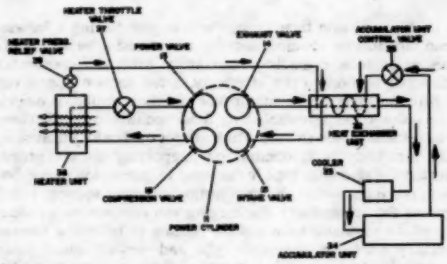
(e) a first exhaust valve associated with the power cylinder for controlling the exhaust flow from the cylinder after the heated working fluid has expanded in the cylinder;

(f) a regenerative heat exchanger in the exhaust flow from the cylinder for absorbing exhaust heat from the working fluid after it has expanded in the cylinder and been exhausted therefrom;

(g) a cooler in downstream fluid communication with the exhausted working fluid for cooling the working fluid after it has expanded in the cylinder and passed through the regenerative heat exchanger;

(h) an accumulator unit for receiving fluid from the cooler and storing said cooled fluid;

(i) a flow passage for allowing fluid to flow from the accumulator unit, through the regenerative heat exchanger, and thence to the power cylinder;



(j) an accumulator control valve regulating the flow of fluid between the accumulator unit and the regenerative heat exchanger;

(k) a second intake valve associated with the power cylinder for controlling the admission of fluid flowing from the accumulator under the influence of the accumulator control valve to the power cylinder;

(l) a second exhaust valve associated with the cylinder for controlling the exhaust of working fluid after it has been compressed in the cylinder;

(m) a flow passage allowing compressed working fluid to flow from the cylinder to the heater;

(n) whereby the working fluid is cyclically heated, expanded, regeneratively cooled, further cooled, stored, regeneratively heated, and compressed, in a cyclically manner; wherein the flow of fluid into and out of the power cylinder is controlled by a pair of inlet and exhaust valves during the power stroke, and a second pair of inlet and outlet valves when the cylinder is performing a compression stroke.

4,962,646

AIR SEPARATION

Thomas Rathbone, Farnham, United Kingdom, assignor to The BOC Group, Inc., New Providence, N.J.

Filed Aug. 30, 1989, Ser. No. 400,319

Claims priority, application United Kingdom, Aug. 31, 1988, 8820582

Int. Cl.[5] F25J *3/02*

U.S. Cl. 62—24 22 Claims

1. A method of air separation comprising:

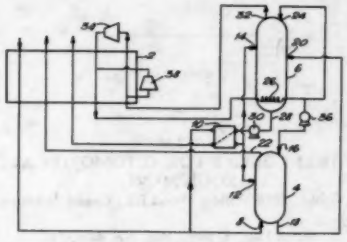
(a) removing carbon dioxide and water vapour from a compressed air feed stream and reducing the temperature of the feed stream to a level suitable for its separation by rectification at cryogenic temperatures;

(b) introducing the air stream into a higher pressure rectifi-

cation column, providing liquid nitrogen reflux for the higher pressure rectification column, and separating the air therein into oxygen-enriched and nitrogen-enriched fractions;

(c) withdrawing a stream of nitrogen-enriched fluid from the higher pressure column;

(d) withdrawing a stream of oxygen-enriched liquid from the



higher pressure column and passing it into a lower pressure rectification column in which it is separated into oxygen and nitrogen fractions;

(e) withdrawing an oxygen stream and a nitrogen stream from the lower pressure rectification column; and

(f) operating a heat pump cycle to provide reboil for the lower pressure rectification column and reflux for both rectificatiion columns.

4,962,647

REFRIGERATING CIRCUIT APPARATUS WITH TWO STAGE COMPRESSOR AND HEAT STORAGE TANK

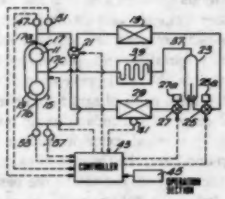
Eiji Kuwahara, Shizuoka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 3, 1989, Ser. No. 318,792

Claims priority, application Japan, Jun. 30, 1988, 63-160780

Int. Cl.[5] F25D *21/06*; F25B *47/02*

U.S. Cl. 62—156 **9 Claims**



1. A refrigerating circuit apparatus comprising:

two stage compressing means including a lower stage compressor element and an upper stage compressor element connected in series for compressing refrigerant, each compressor element respectively having an input port and output port, the output port of the lower stage compressor element being in communication with the input port of the upper stage compressor element, the two stage compressing means having an intermediate port communicating with the output port of the lower stage compressor element and the input port of the upper stage compressor element;

liquid separation means for separating liquid and gaseous refrigerant, said liquid separation means including an inlet port, an outlet port and an intermediate port;

upper stage side variable opening valve means disposed in-line between said output port of said upper stage compressor element and said input port of said liquid separation means for controlling the flow amount of refrigerant exiting the output port of the upper stage compressor element between a fully open position and a fully closed position;

lower stage side variable opening valve means disposed in-line between said output port of said liquid separation means and said input port of said lower stage compressor element for controlling the flow amount of refrigerant into the input port of the lower stage compressor element between a fully open position and a fully closed position;

heat storage means disposed in-line between said intermediate port of said two stage compressor means and said intermediate port of said liquid separation means, said heat storage means for storing heat therein from the refrigerant or for discharging heat therefrom to the refrigerant;

heat-exchange means disposed in-line between said lower stage side variable opening means and said input port of said lower stage compressor element, said heat exchange means for exchanging heat with the refrigerant, the heat-exchange means including an external heat-exchanger subject to accumulation of frost thereon; and

means for controlling the lower stage side variable opening valve means to the fully open position to carry out a defrosting operation wherein refrigerant flows from the intermediate port of the two stage compressing means to the heat storage means to absorb heat into the refrigerant from the heat storage means, and refrigerant then flows from the heat storage means to the external heat-exchanger through the lower stage side variable opening valve means to discharge the absorbed heat from the refrigerant to the external heat-exchanger thereby removing frost accumulated on the external heat-exchanger.

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REFRIGERATION APPARATUS

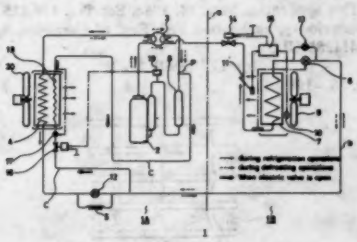
Takashi Takizawa; Kiyoshi Ohshimizu, both of Gunma; Ken Aoki, Tochigi; Hirotaka Nakano, Gunma, and Hiroyuki Kuribara, Saitama, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 13, 1989, Ser. No. 310,449

Claims priority, application Japan, Feb. 15, 1988, 63-32217; Feb. 24, 1988, 63-41538; Apr. 15, 1988, 63-94222

Int. Cl.[5] F25B *5/00, 41/04*

U.S. Cl. 62—199 **6 Claims**



1. A refrigeration apparatus having a main refrigerant line which comprises a compressor, a condenser, an expansion device, and an evaporator all arranged in a loop, characterized in that said refrigeration apparatus further comprises:

a refrigerant flow rate control valve installed at the outlet side of said evaporator;

an auxiliary refrigerant line for bypassing said evaporator and refrigerant flow rate control valve, having a refrigerant-line opening-closing means, an expansion means, and an auxiliary evaporator, and installed between the outlet side of said condenser and the outlet side of said refrigerant flow rate control valve,

and that said compressor is run without interruption by opening the refrigerant-line opening-closing means as the suction pressure of the compressor lowers below predetermined value.

4,962,649

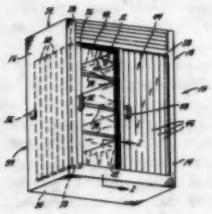
ENERGY CONSERVING REFRIGERATED FIXTURE

Bart Battocletti, #4 Mike Allen, Washington, Mo. 63090

Filed Oct. 10, 1989, Ser. No. 419,373

Int. Cl.[5] A47F *3/04*

U.S. Cl. 62—256 **16 Claims**



1. A refrigerated fixture having an opening for enabling access to the interior of the fixture, the fixture comprising:

track members adapted to be mounted in contact with the opening;

a sectional door mounted between the track members for sliding movement between a closed position and an open position;

refrigeration means for providing refrigerated air;

means for circulating the refergerated air comprising a fan;

air output means disposed around the opening; and

means, connected to the circulating means, for operating the circulating means when the door contacts the operating means comprising a switch which when contacted by the door operates the fan.

4,962,650

WINDING SUPPORT

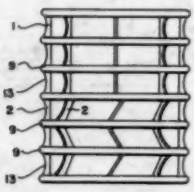
Manfred Hahn, Ahornweg 17, 5100 Aachen, Fed. Rep. of Germany

Continuation of Ser. No. 722,274, Apr. 11, 1985, abandoned. This application Mar. 14, 1988, Ser. No. 170,125

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1984, 8411285[U]

Int. Cl.[5] D06B *17/02*

U.S. Cl. 68—198 **1 Claim**



1. Winding support for treatment of threads or yarns, comprising two end rings each having respective centers defining an axis; a shell ring disposed between said end rings having openings formed therein, said shell ring including intermediate rings formed of a multiplicity of ring elements; spacer elements disposed in said shell ring inter-connecting said ring elements in axial direction, said spacer elements having a dimension being greater in axial and in radial direction than in circumferential direction at least in the region of transition to a ring element, each intermediate and end ring having a perimeter disposed in a respective plane, the shell ring having a wavy surface as seen in the axial direction, and wherein said ring elements are spaced apart in axial direction and have circumferences disposed along a wavy contour, wherein said spacer elements are flexible in tangential direction.

4,962,651

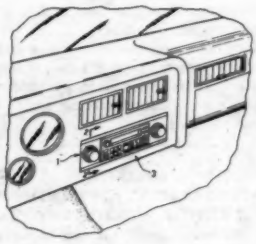
ANTI-THEFT DEVICE FOR AUTOMOTIVE AUDIO EQUIPMENT

Joyce K. Gibbs, 2258 Willow Wood Rd., Grand Junction, Colo. 81503

Filed Dec. 4, 1989, Ser. No. 445,351

Int. Cl.[5] E05B *73/00*

U.S. Cl. 70—58 **38 Claims**



1. A theft prevention device primarily intended for use with automotive audio equipment such as radios and tape players in which the audio equipment has at least one mounting bolt that is threaded and extends through a hole in the dashboard of the automobile or other vehicle, said dashboard having interior and exterior sides with respective members having first and second substantially parallel and planar surfaces through which said hole extends, the theft prevention device including:

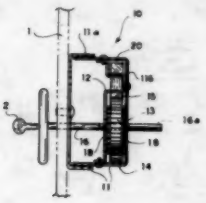
a pair of threaded nuts, each of said nuts being substantially in the overall shape of a truncated cone with a top, base, and substantially conical exterior surface extending between the top and base, the threads of each nut extending interiorly of the nut from the top to the base and the base of each nut having a substantially planar and annular surface, each of said nuts having a recessed portion therein to receive key means for rotating the nut onto the threaded bolt of said audio equipment, the recessed portion of the first of said nuts being in the base thereof and the recessed portion of the second nut being in at least one of the top of the second nut and the exterior conical surface thereof wherein said first nut can be rotated onto said bolt to a first position, said audio equipment can be manipulated to extend said bolt through the hole in said dashboard with the planar base of said first nut facing the first planar surface of said dashboard, and said second nut can be rotated onto said bolt with the planar base of said second nut facing the second planar surface of said dashboard to draw the planar base of said first nut into an abutting relationship with said first planar surface of said dashboard to cover the recessed portion thereof and to draw the planar base of said second nut into an abutting relationship with the second planar surface of said dashboard.

4,962,652

TOPPER LOCK

Randy R. Schneider, 5357 N. 106th Street, Milwaukee, Wis. 53225

Filed Oct. 12, 1989, Ser. No. 420,389
Int. Cl.[5] E05B 65/00
U.S. Cl. 70—89 10 Claims



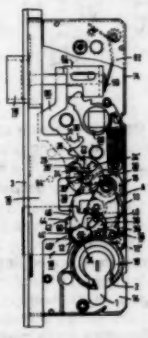
1. A lock for a window on a topper cap including:
an outer housing extending along a major widthwise portion of said window;
an inner housing mounted inside and completely enclosed by said outer housing and distally positioned from said window;
a rotating toothed pinion gear mounted inside said inner housing;
toothed racks mounted inside said inner housing on opposite sides of said rotating pinion gear so that the gear teeth and the rack teeth engage;
deadbolts attached to and extending in opposite directions away from said geared racks, said deadbolts extending through said inner housing and said outer housing;
said outer housing mounted to an inner surface of said topper cap window, said deadbolts able to extend past the frame tubing of said topper cap thereby locking said window closed.

4,962,653

DRIVE ROD LOCK

Ludger Kaup, Everswinkel, Fed. Rep. of Germany, assignor to Aug. Winkhaus GmbH & Co. KG, Telgte, Fed. Rep. of Germany

Filed Jul. 17, 1989, Ser. No. 380,995
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1989, 3901223
Int. Cl.[5] E05B 59/00
U.S. Cl. 70—107 26 Claims



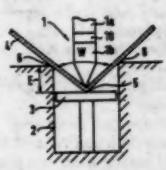
1. Drive rod lock comprising
a drive rod (16) displaceable between an open position (FIGS. 1 and 1a) and a closure position (FIG. 2) in combination with at least one lock element (18, 78, 106, 114, 116),
a lock cylinder (1),
a step-down gearing (A) between the lock cylinder (1) and the drive rode (16) for the displacement of the drive rod (16) between the open position and the closure position and
a blocking device (28, 30) for the drive rod (16) which blocks the drive rode (16) in the closure position (FIG. 2) against displacement in the direction of the open position (FIGS. 1 and 1a) without torque introduction into the step-down gearing (A),
where a control dog construction group (22) is fitted on the gear output drive rod drive pinion (20) for drive engagement with a dog engagement profiling (26, 26') of the drive rode (16) and
where further a stop dog (28) is fitted on the gear output drive rode drive pinion (20) for action upon a counter-abutment face (31) of the drive rod (16),
characterized in that
(a) the dog engagement profiling (26, 26') is made with two recesses (26, 26'),
(b) the drive dog construction group (22) comprises two preferably circular control dogs fitted on the drive dog drive pinion (20), which dogs engage successively in recesses (26, 26') allocated to them by pairs,
(c) the stop dog (28) is arranged in the middle region of the circumferential distance between the two control dogs (24, 24') on the drive rod drive pinion (20),
(d) the recess (26) loaded by a control dog in the closure position (FIG. 2) of the drive rode (16) is made with a limiting finger (30),
(e) the stop dog (28) rests, when the drive rod is in the closure position (FIG. 2), on the flank (31), called blocking flank (31), of the limiting finger (30) which is remote from the recess (26) loaded by the control dog,
(f) the drive rod (16) reaches its closure position before the closing rotating movement of the lock cylinder (1) and of the drive rode drive pinion (20) is terminated and the stop dog (28) after entry of the drive rod (16) into the locked position (FIG. 2), during the thereafter available remaining closure rotating movement of the lock cylinder (1) and of the drive rode drive pinion (20), reaches its blocking position on the blocking flank (31) of the limiting finger (30).

4,962,654

METHOD OF BENDING SHEET METAL PIECES TO A PREDETERMINED BENDING ANGLE

Vaclav Zbornik, Oftringen, Switzerland, assignor to Haemmerle AG, Switzerland

Filed May 2, 1989, Ser. No. 346,139
Claims priority, application Austria, May 3, 1988, 1140/88
Int. Cl.[5] B21D 5/02
U.S. Cl. 72—8 6 Claims



1. A method of bending a workpiece to a predetermined bending angle by means of a bending apparatus having a computer control means and comprising a movable bending bar and a fixed bottom die having a die bottom member, the height position thereof being adjustable in accordance with the bending angle to be achieved, the method comprising the steps of:
inserting a sample sheet metal piece having a predetermined thickness and a predetermined material quality between said movable bending bar and said bottom die;

bending said sample sheet metal piece to different bending angles and noting the depth of penetration of said bending bar into said bottom die for each bending angle, thereby obtaining a series of bending angle/penetration depth value pairs;

deriving from said value pairs a curve trace and storing it in said computer control means as a reference curve trace representing the bending behaviour of said sample sheet metal piece;

removing said sample sheet metal piece from the bending apparatus; and

successively inserting production sheet metal pieces having a thickness tolerance and a material quality substantially equal to said sample sheet metal piece between said bending bar and said bottom die, adjusting said adjustable die bottom to a first height position corresponding to said predetermined bending angle according to said stored reference curve trace and starting to bend each production sheet metal piece, determining the bending behaviour of each production sheet metal piece and comparing its bending behaviour with the bending behaviour of said sample sheet metal piece stored in said computer control means, correcting said first height position of said adjustable die bottom as a function of a deviation observed between said stored bending behaviour and the bending behaviour of said production sheet metal piece under process, and continuing the bending operation until the leading edge of said production sheet metal piece touches the top surface of said adjustable die bottom.

4,962,655

ROLLING STAND WITH ROLLING RINGS SUPPORTED AS A CANTILEVER AND HAVING THEIR AXES AT AN ANGLE TO EACH OTHER

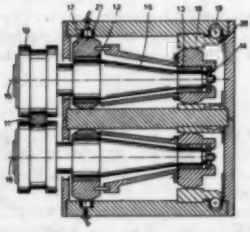
Geremia Nonini, Buttrio, Italy, assignor to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Filed Feb. 13, 1989, Ser. No. 309,194

Claims priority, application Italy, Feb. 25, 1988, 83324 A/88

Int. Cl.[5] B21B *37/08, 31/26, 31/30*

U.S. Cl. 72—21 15 Claims



1. A rolling stand for rolling metallic products, comprising:

a plurality of rolling rings for forming said metallic products;

a plurality of rolling ring shafts supported as a cantilever, supporting said plurality of rolling rings, and each having an axis of rotation coinciding with an axis of rotation of a rolling ring; and

a plurality of bearings rotatably supporting said plurality of rolling ring shafts;

said rings are unsupported about their circumferences and the bearings are positioned on said shafts so that during operation of said rolling stand said plurality of rolling ring shafts are resiliently bent due to resistance to deformation of said metallic products so that the axes of rotation of said plurality of rolling rings are in an optimum orientation,

wherein an angle exists between said axes of rotation of each said plurality of rolling rings such that said axes of rotation converge at a point in front of said rolling stand while the rolling stand is idle, said angle compensating for the bending of the rolling ring shafts during operation of said rolling stand.

4,962,656

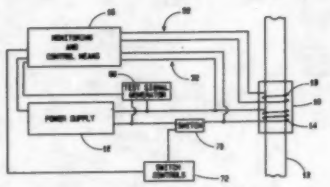
CONTROL AND MONITORING METHOD AND SYSTEM FOR ELECTROMAGNETIC FORMING PROCESS

Dennis C. Kunerth, and Gordon D. Lassahn, both of Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 30, 1989, Ser. No. 373,531

Int. Cl.[5] B21D *26/14*

U.S. Cl. 72—56 18 Claims



1. A process for electromagnetic forming of a workpiece comprising:

forming a workpiece with an electromagnetic force provided by a workcoil connected to a power supply,

monitoring the current and voltage in the workcoil,

deriving a real time the first several time derivatives of the current and voltage in the workcoil whereby a characteristic of the workpiece can be determined.

4,962,657

ROLLING MILL TRAIN, PARTICULARLY ROLLING MILL TRAIN IN A SECTION MILL

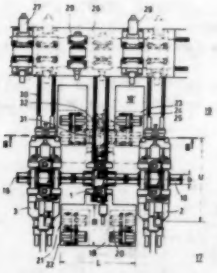
Alexander Svagr, Hilden, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 22, 1989, Ser. No. 314,431

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1988, 3805476

Int. Cl.[5] B21B *31/08*

U.S. Cl. 72—238 14 Claims



1. In a rolling mill train in a section mill with at least one group of rolling mill stands including n stands in a group and middle stands in the group, the rolling mill stands being arranged in a pitch line and having horizontal guide members which are arranged at least on the middle stands spaced closely together in the pitch line, wherein the improvement comprises that the group of stands is a reversing tandem stand group including a first universal stand, an edging stand and a second universal stand, the edging stand being configured to be displaceable for the purpose of exchanging the guide members and the rolls from the pitch line by at least the width of a guide member, wherein a stationary work platform is arranged on the operator side on both sides of the edging stand when the edging stand is in the displaced position and wherein the edging stand has on a drive side of the rolling mill train at least one assembly platform which is displaceable with the edging stand.

4,962,658

METHOD AND APPARATUS FOR STRAIGHT DRAWING A PIPE

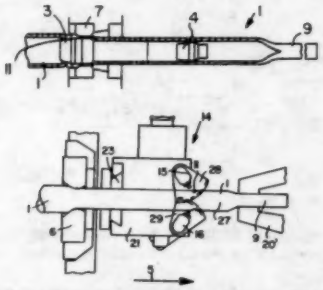
Karl-Heinz Komp, Aachen, Fed. Rep. of Germany, assignor to Firma Schumag AG, Aachen, Fed. Rep. of Germany

Filed Jul. 31, 1989, Ser. No. 387,861

Claims priority, application European Pat. Off., Aug. 3, 1988, 88112596.7

Int. Cl.[5] B21C *1/24*

U.S. Cl. 72—283 **14 Claims**



1. A method for straight drawing a pipe, to reduce the pipe diameter and pipe wall thickness, comprising the following steps:

(a) providing a number of drawing mandrel sections forming a set in which the mandrel sections are without any interconnection between said mandrel sections,

(b) inserting said set of mandrel sections into said pipe so that the set is located between a mandrel section stopping dent and a gripper end of said pipe with a largest diameter mandrel section nearest to said mandrel section stopping dent, with a smallest diameter mandrel section near said gripper end and without any spacing between neighboring mandrel sections,

(c) drawing said pipe through drawing die means corresponding in number to said number of drawing mandrel sections, in a drawing direction such that said gripper end passes first through a nozzle of said drawing die means, whereby all drawing mandrel sections, except the largest diameter mandrel section, travel along with the drawn pipe still substantially without any spacing between neighboring mandrel sections while said largest diameter pipe section is stopped by said drawing die means for a first diameter and pipe wall thickness reduction, and

(d) denting said pipe with a denting tool that moves along with said pipe while said pipe is being drawn, said denting taking place in a zone of already reduced pipe wall thickness downstream of the respective drawing die means yet close to the drawing mandrel section which last passed through the preceding drawing die means, whereby hollow drawing is kept optimally low, and so that said denting is completed at the latest when said drawing step is completed.

4,962,659

REDRAWING METHOD

Katsuhiro Imaza, Yokohama; Tomomi Kobayashi, Yokohama; Masao Ishinabe, Atsugi, and Hisao Iwamoto, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Feb. 23, 1989, Ser. No. 313,843

Claims priority, application Japan, Feb. 23, 1988, 63-38579

Int. Cl.[5] B21D *22/20*

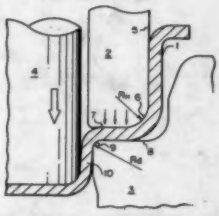
U.S. Cl. 72—349 **14 Claims**

1. A redrawing method for forming a deep-drawn cup from a shallow-drawn cup previously drawn from a covered metal sheet wherein the redraw ratio, defined by the ratio of the diameter of the shallow-drawn cup to the diameter of the deep-drawn cup, is in the range of from 1.1 to 1.5;

placing the shallow-drawn cup in a redrawing die having an operating corner part having a radius (R_D) of curvature which is 1 to 2.9 times as large as the bare sheet thickness (t_B) of the metal sheet;

inserting an annular holding member in the shallow-drawn cup with the holding member having a holding corner part with a radius (R_H) of curvature 4.1 to 12 times as large as the bare sheet thickness (t_B) of the metal sheet;

applying a clamping force between flat engaging portions of the holding member and the redrawing die and the shallow-drawn cup to provide a dynamic friction coefficient of 0.001 to 0.2; and



moving a redrawing punch and said redrawing die relative to each other to move the redrawing punch through the holding member into contact with the shallow-drawn cup and forming a deep-drawn cup having a diameter smaller than that of the shallow-drawn cup;

wherein said forming step comprises at least one stage including bending and elongating the entire side wall portion of the cup uniformally in the direction of the height of the cup by the operating corner part of the redrawing die thereby providing a uniformly reduced thickness for the entire side wall portion throughout the length thereof.—

4,962,660

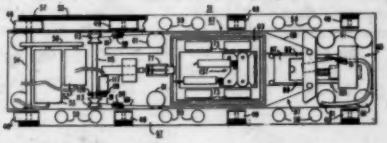
APPARATUS FOR IMPACT TESTING FOR ELECTRIC GENERATOR STATOR WEDGE TIGHTNESS

George F. Dalley, Plum Borough, and Mark W. Fischer, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 19, 1989, Ser. No. 367,658

Int. Cl.[5] G01N *3/30*

U.S. Cl. 73—12 **29 Claims**



14. Apparatus for measuring the tightness of stator wedges in the stator of an electric generator without removing the rotor, said apparatus comprising:

a low profile remotely controlled carriage insertable in a narrow gap between the rotor and stator and successively positionable adjacent selected stator wedges;

an impactor carried by said low profile carriage, said impactor striking the selected stator wedge to set up a mechanical vibration therein;

a vibration detector carried by said low profile carriage detecting deflection of the selected stator wedge as said wedge vibrates in response to being struck by said impactor; and

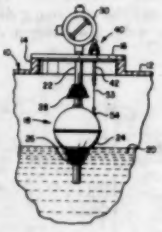
means seismically isolating said vibration detector from said impactor.

4,962,661

LIQUID LEVEL SENSING SWITCH ACTUATOR

Robert A. Levine, Westminster, and William M. Croke, Huntington Beach, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 9, 1990, Ser. No. 478,114
Int. Cl.[5] G01F 25/00
U.S. Cl. 73—1 H 12 Claims



1. An actuator for a liquid level sensing switch for testing the operability of said level sensing switch operation, said level sensing switch including a float member moveable in response to a change in liquid level in a tank to effect a signal related to said changing level, said actuator comprising:

a support member adapted to be secured to a part supported by said tank, said support member having a generally cylindrical bore extending therethrough;

an elongated actuating rod extending through said bore and into said tank;

means connected to said rod for causing said rod to be moved relative to said support member to effect movement of said float member; and

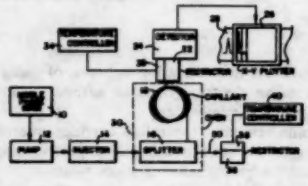
means interconnecting said float member with said rod and responsive to movement of said rod in one direction while permitting the movement of said float member with respect to said rod in response to said changing level of liquid in said tank, said interconnecting means being positioned within said tank during normal level sensing switch operation.

4,962,662

SUPERCRITICAL FLUID CHROMATOGRAPHY

Terry A. Berger, Landenberg, Pa., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 157,344, Feb. 17, 1988, Pat. No. 4,845,985.
This application Jul. 10, 1989, Ser. No. 377,420
Int. Cl.[5] G01N 30/32
U.S. Cl. 73—23.42 10 Claims



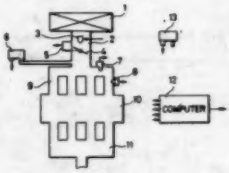
1. An apparatus for controlling the mass flow of a mobile phase in a chromatographic analysis system, said apparatus comprising: a restrictor, through which the mobile phase passes, and heater means, which transfers heat to said restrictor, for heating said mobile phase in said restrictor so that for a given mobile phase pressure the mass flow of said mobile phase is maintained at a preselected level by modifying the temperature of said mobile phase in said restrictor.

4,962,663

METHOD OF MEASURING ATMOSPHERIC PRESSURE FOR AN INTERNAL COMBUSTION ENGINE

Takeki Mitani, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 159,089, Feb. 23, 1988, abandoned.
This application Oct. 18, 1989, Ser. No. 423,678
Claims priority, application Japan, Feb. 23, 1987, 62-40960
Int. Cl.[5] G01M 15/00
U.S. Cl. 73—115 5 Claims



4. In a combustion engine having a suction pipe connected thereto, a system for measuring atmospheric pressure comprising:

sensor means provided at the suction pipe for detecting negative pressure in a suction pipe and generating an output voltage; and

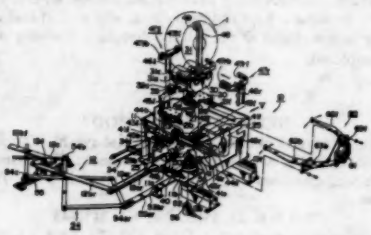
means for measuring a maximum ripple value of said output voltage of said sensor means when the engine is first turned on after having been in a non-rotative state, such maximum ripple value of said sensor means output voltage being extremely approximate to atmospheric pressure.

4,962,664

ROLLER CLAMP TYPE WHEEL EXAMINING APPARATUS

Akira Hirano, Hidaka; Shinichi Watanabe, Sayama; Yutaka Fukuda, Tokorozawa; Yukio Higuchi, Fuji; Fumio Shibano, Sakado; Hiroshi Sekino, Tokyo; Hiroichi Nabeshima, Hidaka, and Yukimasa Nishizawa, Iruma, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha and Anzen Motor Car Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 196,208, May 19, 1988, Pat. No. 4,901,560.
This application Apr. 7, 1989, Ser. No. 335,321
Claims priority, application Japan, Sep. 14, 1986, 62-228248; May 20, 1987, 62-121127; May 20, 1987, 62-121128; May 20, 1987, 62-121129; May 20, 1987, 62-121130; May 20, 1987, 62-121126; Sep. 14, 1987, 62-228247; Sep. 14, 1987, 62-228249; Sep. 14, 1987, 62-228250
Int. Cl.[5] G01M 19/00
U.S. Cl. 73—118.1 16 Claims



1. A roller clamp type wheel examining apparatus, comprising:

supporting means having a flat support surface for supporting thereon a wheel of a vehicle;

a plurality of rollers for clamping both sides of said wheel

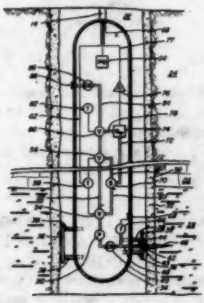
supported on said supporting means, said plurality of rollers being so arranged to be brought into rolling contact with the bottom half portion of said wheel such that each of said plurality of rollers has a rotating axis extending generally in the radial direction of said wheel when brought into contact therewith; and angle detecting means for detecting a relative angle defined between said wheel and a predetermined reference line with said wheel clamped by said plurality of rollers.

4,962,665

SAMPLING RESISTIVITY OF FORMATION FLUIDS IN A WELL BORE

Kerry D. Savage, and Irwin R. Supernaw, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 25, 1989, Ser. No. 411,786
Int. Cl.[5] E21B 49/10; G01V 3/18
U.S. Cl. 73—155 20 Claims



1. A well logging tool for sampling resistivity of fluids in a formation adjacent a well bore, comprising:

a sonde;

means for conveying a mixture of fluids from the formation into said sonde;

a conduit in said sonde for receiving the mixture of fluids from said means for conveying;

means for moving the mixture of fluids through said conduit in said sonde;

means in said sonde for sampling the mixture of fluids moving through said conduit in said sonde;

means in said sonde for separating denser formation fluids from the mixture in the sample taken by said means for sampling; and

means in said sonde for obtaining a measurement of the resistivity of the separated denser formation fluids.

4,962,666

MASS FLOWMETER APPARATUS

Billy R. Adney, Orange, Tex.; Charles W. Alworth, Ponca City, Okla.; John B. Durkee, Ponca City, Okla., and Bryce T. Jeffries, Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

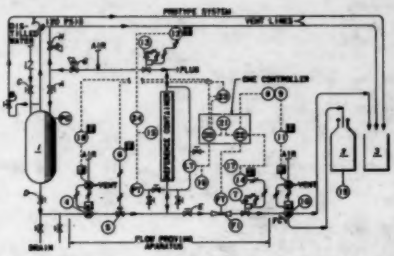
Filed Jan. 11, 1989, Ser. No. 295,862
Int. Cl.[5] G01F 3/38, 25/00
U.S. Cl. 73—223 4 Claims

1. A non-venting mass flowmeter apparatus comprising:

(1) a substantially vertical container having a known mass content per unit of height or weight, said container in direct open fluid communication with conduits capable of carrying liquids;

(2) means capable of providing a set minimum positive displacement pressure in said vertical container;

(3) means for filling said vertical container against said set minimum pressure; and



(4) means for monitoring the amount of liquid in said container as change in mass over a measured time interval.

4,962,667

ULTRASONIC IMAGING APPARATUS

Toshio Ogawa; Kageyoshi Katakura, both of Tokyo; Shin-ich Kondo, Kodaira; Shin'ichiro Umemura; Hiroshi Ikeda, both of Hachioji; Noriyoshi Ichikawa, Ibaraki, and Kinji Kuriyama, Matsudo, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Continuation of Ser. No. 917,069, Oct. 8, 1986, abandoned. This application Jul. 24, 1989, Ser. No. 384,109
Claims priority, application Japan, Oct. 9, 1985, 60-223605; Oct. 9, 1985, 60-223612
Int. Cl.[5] G01N 29/00
U.S. Cl. 73—626 9 Claims

1. An ultrasonic imaging apparatus comprising:

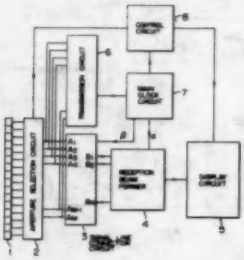
an array type ultrasonic probe having a plurality of arrayed probe elements;

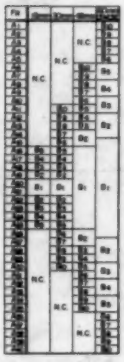
beam transmission means for supplying to at least a part of said probe elements transmission signals which are respectively subject to differently specified delays so as to generate an acoustic beam which converges to a predetermined focal point;

signal line connection means for setting up a plurality of element groups each having a plurality of adjacently arrayed probe elements which are electrically interconnected together, by connecting a plurality of signal lines respectively extending from said adjacently arrayed probe elements, the number of said plurality of adjacently arrayed probe elements in respective ones of said element groups being decreased in a direction from a center of a reception aperture of said array type ultrasonic probe toward an edge of the reception aperture thereof, said element groups being respectively connected to output signal lines of said signal line connection means; and

reception beam former means for applying different delays

to respective signals on output signal lines of said signal line connection means and adding delayed signals to-





gether so as to form a reception signal representative of a reception beam having a predetermined focal point.

4,962,668

MATERIAL STRESS MONITOR

Christopher J. Preston, 1225 Glenwood Road, North Bay, Ontario, Canada P1B 457; John J. Cotter, 982 Jane Street, North Bay, Ontario, Canada P1B 3H7; John Codrington, 50 Melrose Drive, R.R. #1, Niagara-on-the-Lake, Ontario, Canada; Dimitri Frantzos, 3270 Fairway Road, Niagara Falls, Ontario, Canada L2J 3R6, and Pierre Hamel, 36 Marlowe Cr., Ottawa, Ontario, Canada K1S 1H6

Filed May 3, 1989, Ser. No. 346,681

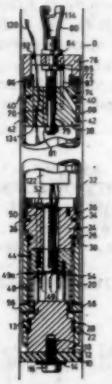
Claims priority, application Canada, May 6, 1988, 566248

Int. Cl.[5] G01B *7/16*

U.S. Cl. 73—784 **18 Claims**

1. A sensor unit for use in an in situ material stress monitor for measuring changes in static and dynamic material stresses, said sensor unit being mountable in a borehole in the material to be monitored, the sensor unit comprising:

a generally hollow waterproof tubular body having means for shock isolating said body from said material,



a transducer mounted within said body, said transducer providing an output signal responsive to the deflection of the sidewall of the borehole,

and a means for coupling said transducer to said sidewall.

4,962,669

METHOD AND APPARATUS FOR MEASURING DEFORMATIONS OF TEST SAMPLES IN A TESTING MACHINE

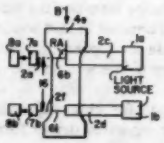
Peter Gernhart, Klingenberg; Gerhart Hintz, Rossdorf; Guenter Keller, Modautal; Werner Treusch, Fraenkisch Crumbach, and Karl Zoeller, Alsbach-Haehnlein, all of Fed. Rep. of Germany, assignors to Carl Schenck AG, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 207,754, Jun. 16, 1988, abandoned. This application Oct. 6, 1989, Ser. No. 418,400

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720248

Int. Cl.[5] G01L *1/24*

U.S. Cl. 73—800 **9 Claims**



1. A method for measuring deformations caused by at least one of a tensile force and a torque moment applied as a testing load to a test sample in a testing machine, comprising:

(a) producing two sheet-like incident light beams;

(b) directing both said sheet-like incident light beams at respective narrow band-shaped mirrors directly attached to said test sample for following a movement of said test sample in response to the application of said testing load to said test sample;

(c) reflecting each of said sheet-like incident light beams by the respective band-shaped mirror to form two reflected light beams each having substantially a point cross-section;

(d) receiving each of said reflected light beams on a respective position detector whereby said reflected light beams

form an impingement location on each of said position detectors;

(e) generating an output signal in each of said position detectors dependent on said impingement location to provide two output signals; and

(f) evaluating said two output signals in an evaluating circuit to determine a movement of said impingement locations in response to an application of said testing load to said test sample, said movement representing a measure of said deformation.

4,962,670

FLUID FLOW METERS

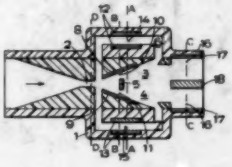
Michael L. Sanderson, Cranfield, and John R. Heritage, Camberley, both of England, assignors to Severn Trent Water Limited, Birmingham, England

Filed Jan. 31, 1990, Ser. No. 472,386

Claims priority, application United Kingdom, Feb. 1, 1989, 8902173

Int. Cl.[5] G01F *1/20*

U.S. Cl. 73—861.19 10 Claims



1. A meter for measuring the flow of electrically conducting liquids comprising a fluidic oscillator having multiple flow paths, means for producing a magnetic field across at least one of said flow paths in which the flow changes at a rate dependent on the total flow, a pair of electrodes placed to detect the resultant electric potential difference generated in the liquid in said path in a direction transverse to said changing flow and said magnetic field, and means for measuring the frequency of that potential difference and/or counting the cycles thereof.

4,962,671

SINGLE VIBRATING TUBE TRANSDUCERS

James W. Stansfeld, Nr. Alton, and David I. H. Atkinson, Farnham, both of England, assignors to Schlumberger Industries Limited, Farnborough, England

Filed Nov. 18, 1988, Ser. No. 273,452

Claims priority, application United Kingdom, Nov. 19, 1987, 8727100

Int. Cl.[5] G01F *1/84*

U.S. Cl. 73—861.37 14 Claims

1. A single vibrating tube transducer comprising a straight tube through which a fluid to be measured flows, first and second nodal masses attached to respective ends of the tube, means for vibrating the tube, and at least one means for sensing the vibrations of the tube, wherein each nodal mass has a first extended portion extending alongside the tube towards the other nodal mass and a second oppositely extending portion counterbalancing the first portion and rendering the centre of gravity proximal to the point of attachment of the mass to the tube.

4,962,672

TORQUE SENSOR

Toru Yagi, and Hideo Matsuki, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

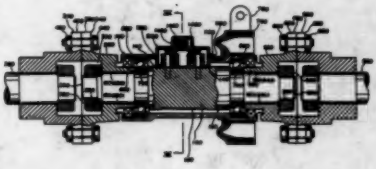
Division of Ser. No. 160,682, Feb. 26, 1988, Pat. No. 4,899,597.

This application Oct. 23, 1989, Ser. No. 426,321

Claims priority, application Japan, Feb. 27, 1987, 62-045814; Feb. 27, 1987, 62-045815; Feb. 27, 1987, 62-045816; Feb. 27, 1987, 62-045817

Int. Cl.[5] G01L *3/10*

U.S. Cl. 73—862.36 9 Claims



9. A torque sensor for measuring torque applied to a rotatable shaft, comprising, a first member for attaching to the shaft to rotate with the shaft and responding to torque applied to the shaft, a magnetic element provided on an outer surface of the first member, a second member enclosing at least a portion of the first member having the magnetic element, said first member being rotatable relative to the second member, and means positioned on an inner wall of the second member for detecting changes in the magnetic characteristics of the magnetic element for measuring the torque applied to the shaft, wherein the first member is a shaft element interposed in axial alignment with and in place of a section of the rotatable shaft, and said first member has ends coupled to spaced ends of the rotatable shaft,

wherein said detecting means comprises a core and coils wound thereon, said second member having an opening closable by a cover and said coils being positioned at an inner wall of the cover, and wherein said inner wall of the cover is made flat.

4,962,673

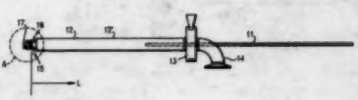
PRESSURE REDUCTION DEVICE FOR PARTICLE SAMPLING FROM COMPRESSED GASES

Hwa-Chi Wang, Downers Grove; Donnel Montgomery, Chicago; Horng-Yuan Wen, Brookfield, and Gerhard Kasper, Downers Grove, all of Ill., assignors to American Air Liquide, Countryside, Ill.

Filed Mar. 8, 1989, Ser. No. 320,504

Int. Cl.[5] G01N *1/22*

U.S. Cl. 73—864.73 9 Claims



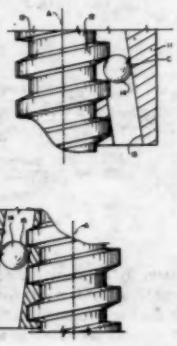
1. An orifice-type pressure reducing device for analyzing particles from compressed gases, which comprises:

an expansion chamber;

a clean orifice disc positioned at an upstream end portion of said expansion chamber; and

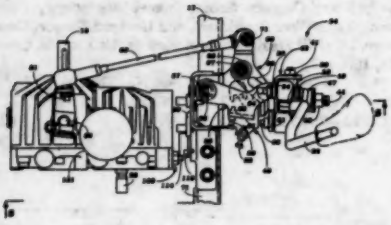
a sample probe positioned in said expansion chamber.

4,962,674
SAFETY DEVICE
John C. Payne, F. J. Payne and Son Limited, Stanton Harcourt Road, Eynsham, Oxford, United Kingdom OX8 1JT
Filed Jul. 1, 1988, Ser. No. 214,327
Claims priority, application United Kingdom, Jul. 3, 1987, 8715644
Int. Cl.[5] F16H 25/24; F16D 63/00
U.S. Cl. 74—89.15 8 Claims



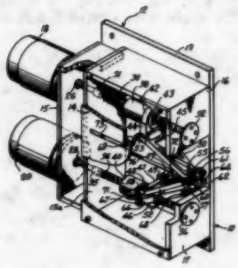
1. A normally helically interacting shaft and nut having a common longitudinal axis along which the nut can be displaced linearly by rotation of the shaft; characterised by the nut having a passage including a wedging surface inclined at an angle to the longitudinal axis and facing into an aperture in the nut normally partially occupied by a threaded portion of the shaft; and a detent located in the passage, the detent normally being loosely located in a direction parallel to the longitudinal axis by way of threads on the shaft and in a direction transverse the axis and radially furthest therefrom by the wedging surface and radially nearest thereto by the shaft.

4,962,675
SHIFTING DEVICE FOR LAWN MOWER AND THE LIKE
Kazuo Aoi, and Takanori Suzuki, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed Mar. 17, 1989, Ser. No. 325,305
Claims priority, application Japan, Mar. 18, 1988, 63-65372
Int. Cl.[5] G05G 7/00; F16D 31/02
U.S. Cl. 74—473 R 10 Claims



1. In a shifting device for shifting a hydrostatic transmission between a forward position, a neutral position and a reverse position comprising a shift lever moveable through a range of positions from a forward through a neutral area to a reverse area, control means for pressurizing a first conduit to effect forward operation of said transmission and a second conduit to effect reverse operation of said transmission, and means for operating said control means to pressurize said first conduit upon movement of such shift lever from said neutral area into said forward area and said control means to pressurize said second conduit upon movement of said shift lever from said neutral area into said reverse area, the improvement comprising means for delaying the operation of said transmission into at least one of its drive modes upon movement of the shift lever from its neutral position for a predetermined degree of movement toward that drive mode selecting position.

4,962,676
TWO AXIS TRANSFER DEVICE
Michael Valnstock, Marblehead, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Oct. 12, 1989, Ser. No. 420,580
Int. Cl.[5] G05G 11/00; B25J 17/00
U.S. Cl. 74—479 16 Claims



1. A dual axis transfer device comprising:
wall structure defining a frame means;
a pair of motor means fixedly mounted on said frame means, each said motor means having a shaft connected thereto, said shafts being fixed in parallel relation one with the other;
a pair of carrier members, a first carrier member being connected to one said shaft and a second carrier member being connected to the other said shaft, for movement along said shafts;
a pair of arms interconnecting said carrier members and connected one to the other at a common pivot point, whereby the energizing of a motor means is effective to move said common pivot point relative to said frame means.

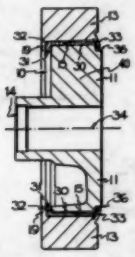
4,962,677
HARMONIC BALANCER
Graham R. Withers, 1297 Nepean Highway, Cheltenham, Victoria, Australia
Continuation of Ser. No. 258,699, Jul. 25, 1988, abandoned. This application Oct. 30, 1989, Ser. No. 428,418
Claims priority, application Australia, Dec. 1, 1986, PH9268
Int. Cl.[5] F16F 15/10
U.S. Cl. 74—574 3 Claims

1. A torsional vibration damper, comprising:
(a) a hub section adapted to be fitted to a rotatable shaft requiring balancing, wherein the hub section rotates with said shaft about an axis of rotation, said hub section comprising an outwardly directed peripheral face;
(b) an annular ring of elastomeric material received over said peripheral face of said hub section;
(c) an inertia ring press fitted over said elastomeric material ring, with an inwardly directed face of said inertia ring engaging said elastomeric material, said inertia ring having a mass sufficient to provide a significant moment of inertia when in use;
(d) an inwardly directed member formed in one piece with, an located at or adjacent one axial end of, said inertia ring.

the inwardly directed member having a free end located at a radial distance from the axis of rotation of said damper less than the radial distance of the peripheral face of said hub section from the axis of rotation of the balancer; and

(e) a plastically deformable member integrally formed in one piece with said inertia ring, located at or adjacent the other axial end of said inertia ring, said deformable member having a free end which is constructed and adapted to be in either an undeformed state or a deformed state, wherein

(1) when said deformable member is in said undeformed



state, it is spaced from said axis of rotation a distance no less than the radial distance between the axis of rotation and an outer surface of said elastomeric material; and

(2) when said deformable member is in said deformed state, the free end of said deformable member is located at a radial distance from said axis of rotation less than the radial distance of the peripheral face of said hub section from the axis of rotation of the balancer;

wherein said harmonic torsional vibration damper is constructed and adapted so that said rotatable shaft's torsional vibration is damped and said rotatable shaft is balanced.

4,962,678

HYDRAULIC CONTROL METHOD FOR CONTINUOUSLY VARIABLE SPEED CHANGE GEAR MECHANISM FOR A VEHICLE AND A DRIVE CONTROL METHOD FOR A PRESSURE VALVE THEREOF

Katsuaki Murano; Sadayuki Hirano, both of Hamamatsu; Yoshinori Yamashita, Hamana; Takumi Tatsumi, and Hiroaki Yamamoto, both of Himeji, all of Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

Division of Ser. No. 229,942, Aug. 8, 1988. This application Mar. 23, 1990, Ser. No. 497,995

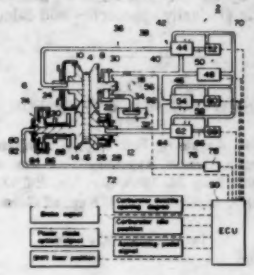
Claims priority, application Japan, Aug. 10, 1987, 62-199420; Oct. 31, 1987, 62-274746; Dec. 10, 1987, 62-310815

Int. Cl.[5] B60K *41/18*

U.S. Cl. 74—844 **2 Claims**

1. A line pressure control method of a continuous variable speed change gear in which a pulley has a fixed pulley member fixed to a rotary shaft and a movable pulley member attached to the fixed pulley member so as to come into contact with and be removed from the fixed pulley member, a groove width between both of said fixed and movable pulley members is being decreased or increased by an oil pressure, thereby reducing or increasing a rotational radius of a belt wound between both of said fixed and movable pulley members and changing a change gear ratio, and thereby controlling the change gear,

wherein an oil temperature is detected when an operating mode is shifted from a holding mode to a starting mode, and when the oil temperature is a predetermined tempera-



ture or lower, a duty for a line pressure is increased to thereby raise the line pressure.

4,962,679

METHOD OF CONTROLLING SPEED REDUCTION RATIO FOR A CONTINUOUSLY VARIABLE SPEED TRANSMISSION

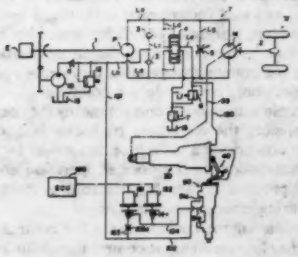
Yoshikazu Ishikawa; Kouji Yamaguchi, both of Saitama, and Koji Sasajima, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1988, Ser. No. 260,186

Claims priority, application Japan, Oct. 20, 1987, 62-264838

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—866 **1 Claim**



1. A method for controlling a speed reduction ratio of a continuously variable transmission comprising the steps of:

determining a predicted acceleration dV_o/dt calculated from a reserved power of an engine and a reference change rate dN_e/dt of an engine speed obtained based on a parameter representing a driver's intention to accelerate or decelerate,

calculating a change rate di/dt of speed reduction ratio by the following equation using the above values

$$di/dt = -C_1{*}(N/V^2){*}(dV_o/dt) + C_2{*}(1/V){*}(dN_e/dt)$$

where C_1 and C_2 are constants, and an asterisk ("*") means multiplication,

setting a reference engine speed corresponding to said parameter, and

controlling the speed reduction ratio using said calculated change rate di/dt of speed reduction ratio as a control value so that an actual engine speed coincides with said reference engine speed;

said method further comprising the steps of:

keeping the speed reduction ratio unchanged for a pre-

scribed delay time when said parameter is lowered, and then

controlling the speed reduction ratio using a change rate corrected by a coefficient K_{OFF} so that, with time, the change rate gradually approaches said calculated change rate di/dt.

4,962,680

ELECTRONIC CONTROL DEVICE FOR A DRIVE SYSTEM

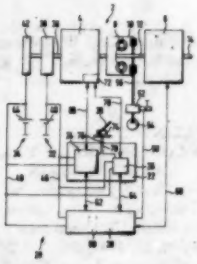
Gerhard Kirstein, Augsburg, Fed. Rep. of Germany, assignor to Renk Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed May 26, 1989, Ser. No. 358,931

Claims priority, application Fed. Rep. of Germany, May 27, 1988, 3818007

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—866 **5 Claims**



1. An electronic control device for a drive system having an engine, a transmission selectably connected to be driven by said engine, and said transmission including a hydrodynamic torque converter, a bridging clutch for selectably bridging the hydrodynamic torque converter, and an automatic gear-shift mechanism for coupling the engine to a drive system output shaft, the electronic control device comprising:

an electronic transmission control means for controlling the transmission, the electronic transmission control means further comprising a main program means for controlling the transmission during normal operation and an emergency program means for controlling the transmission unit during emergency operation;

an electronic engine control means for controlling the engine, the electronic engine control means further comprising a main controller means and an emergency controller for adjusting and controlling hte engine as a function of a setting of a speed adjuster and also as a function of other operating data, including engine rotatinal speed, torque, supercharger air, and temperature of the drive system, such that the emergency controller is activated automatically only if the main controller fails;

wherein the emergency controller has a functional deficiency causing a functinal disadvantage in the driving system with respect to the main controller;

wherein the electronic transmission control means and the emergency program means are matched to the functional deficiency of the emergencycontroller so that the functional disadvantage is eliminated at least in part; and

wherein further the electronic engine control means and the electronic transmission control means are electrically connected with one another so that the emergency program means of the electronic transmission control means is automatically activated when the emergency controller is activated; and

wherein the electronic transmissin control means opens the bridging clutch through an activation element connected thereto and keeps the bridging clutch in an open state when the emergency program means and the emergency controller means are activated.

4,962,681

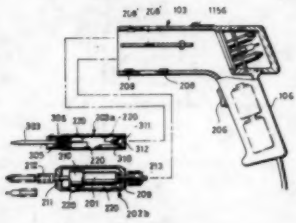
MODULAR MANUAL ELECTRIC APPLIANCE

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa,, Taiwan

Continuation-in-part of Ser. No. 270,466, Nov. 9, 1988, abandoned, which is a continuation of Ser. No. 156,027, Feb. 16, 1988, abandoned. This application Nov. 29, 1988, Ser. No. 277,651

Int. Cl.[5] B25B *21/00*

U.S. Cl. 81—54 **4 Claims**



1. A hand-held electric appliance comprising a housing having a handle portion and further having a generally cylindrical tubular portion extending forwardly of the handle portion, the cylindrical tubular portion having mounted therein a pair of axially spaced-apart power supply contacts, each of said power supply contacts comprising a substantially annular band, respective conductors connecting the annular bands and a power supply means, an electric appliance module being releasably mounted within said tubular portion and incorporating an electric appliance portion which is connected to further contacts located on the exterior of the appliance module, said further contacts being spaced-apart axially on said electric appliance module and engaging said axially spaced-apart power supply contacts when said module is inserted into the tubular portion of the housing, such that the module may be inserted into the tubular portion without regard for the relative circumferential orientation therebetween.

4,962,682

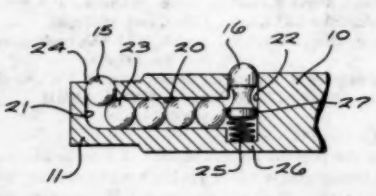
WRENCH EXTENSION AND SOCKET COUPLER

Stephen T. Rose, and Tae-Woo Park, both of Lancaster, Calif.

Continuation of Ser. No. 191,330, May 9, 1988, abandoned. This application Jul. 11, 1989, Ser. No. 378,149

Int. Cl.[5] B25B *23/16*

U.S. Cl. 81—177.85 **33 Claims**



1. In combination for providing a quick coupling by a user to, and a decoupling by the user from, a socket with a cavity having a particular configuration and extending in a substantially axial direction and defining a detent at one position in the cavity,

an extension shaft having an end extending in the particular direction with the particular configuration for mating

with the cavity in the socket and having a fixed disposition relative to the socket in the substantially axial direction during a coupling of the shaft to the socket and a decoupling of the shaft from the socket,

a first lateral passageway extending at least partially through the shaft, from a position external to the shaft, in a direction transverse to the substantially axial direction at a position beyond the cavity in the socket with the shaft in mating relationship with the cavity, the first lateral passageway communicating directly with the atmosphere,

a second lateral passageway extending at least partially through the shaft in the transverse direction from a position external to the shaft and within the cavity in the socket with the shaft in mating relationship with the cavity,

an internal passageway disposed in the shaft and extending substantially in the substantially axial direction and communicating with the first and second lateral passageways,

first means disposed in the internal passageway and variably positioned substantially axially in the internal passageway, the variable positioning of the first means occurring in accordance with the depression or release of depressible means, and

second means variably disposed in the second lateral passageway,

said depressible means being disposed in the first lateral passageway and projecting externally from the first lateral passageway to a position communicating directly with the atmosphere for direct manual contact by the user and having means for cooperating with a portion of said first means when said depressible means is depressed, enabling disposition of said second means toward said internal passageway for coupling and decoupling said socket.

4,962,683

ROTARY CUTTER APPARATUS

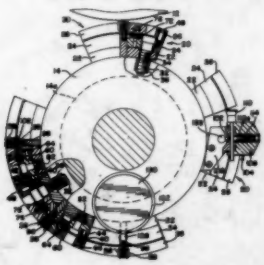
Bruce A. Scheffer, Valparaiso, and Eric K. Lo, Portage, both of Ind., assignors to Scheffer, Inc., Merrillville, Ind.

Continuation-in-part of Ser. No. 121,319, Nov. 16, 1987, Pat. No. 4,799,414. This application Apr. 26, 1988, Ser. No. 186,372

The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.

Int. Cl.[5] B26D *1/62*

U.S. Cl. 83—103 **36 Claims**



1. A cutter assembly for use in a rotary web cutter apparatus having rotatable anvil and knife cylinders supported in parallel spaced apart relation and between which a web material passes during generally transverse cutting or perforating thereof, said cutter assembly comprising a first block member adapted to be mounted on the periphery of the knife cylinder for rotation therewith, a second block member supporting an elongated knife blade thereon and being mounted on said first block member for pivotal movement about a pivot axis parallel to and spaced from said knife blade, and means cooperative with said first and second block members so as to bias said second block member about said pivot axis away from said first block member but enabling pivotal movement of said second block member toward said first block member when said cutter assembly is mounted on the knife cylinder and said knife blade engages the web material against the anvil cylinder, said biasing means being operative to effect a predetermined cutting force between said knife blade and the web during a web cutting operation.

4,962,684

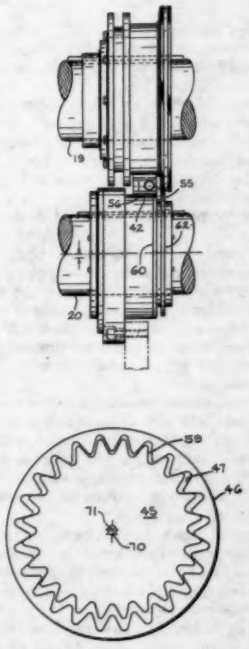
CUTTING DEVICE FOR A BOARD MACHINE

Donald E. Mowry, P.O. Box 314, Norwalk, Ohio 44857

Filed Apr. 7, 1989, Ser. No. 334,338

Int. Cl.[5] B26D *1/24*

U.S. Cl. 83—332 **9 Claims**



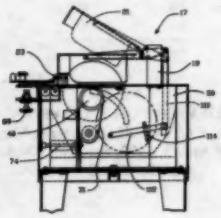
1. A cutting device for a corrugated board or solid fiber board machine, said machine having at least one pair of parallel first and second rotatable shafts, an eccentric means operatively connected to said first shaft for moving the center of rotation of said first shaft, at least one first cutter head mounted on said first shaft, a mating cutter head having a slotting knife mounted on said second shaft, said mating cutter head having a cross knife mounted thereon, said first cutter head having first and second cooperating members, said first member mounting a mating adjustable cutter for cooperation with said slotting knife, said second member defining an anvil surface for cooperation with said cross knife, whereby limited rotation of said eccentric means eccentrically reorientates said first and second cooperating members for adjustably moving said mating adjustable cutter to cut or score boards of different thickness while maintaining a desired cutting spacing between the cross knife and said anvil surface.

4,962,685

PRODUCTION TABLE SAW

Oscar E. Hagstrom, 1132 Holly Oak Cir., San Jose, Calif. 95120

Filed Oct. 27, 1988, Ser. No. 263,053
Int. Cl.[5] B26D 5/10; B27B 5/20
U.S. Cl. 83—397 16 Claims



1. A production saw comprising:

a work stand having an internal cavity, a working surface, a blade slot in the working surface, the rotatable plate carrying said blade slot;

a saw blade movable from an unexposed position fully received by said work stand to an exposed position wherein at least a portion of the blade is exposed through said blade slot to a facilitate cutting;

drive means for driving the saw blade to facilitate cutting through a workpiece;

a safety guard for protecting the blade while the saw is in operation;

foot operated means for moving the saw blade between said unexposed position and said exposed position at all working orientations of the rotatable plate, the foot operated means cooperating with the safety guard to insure that the safety guard is always placed over the saw blade when the blade is exposed through said blade slot and for lifting the safety guard away from the blade slot when the blade is in said unexposed position,

said foot operated means including a rocker arm that carried said saw blade and said drive means and a foot pedal mounted to said work stand and coupled to the rocker arm such that movements of the foot pedal cause the rocker arm to pivot, wherein said pivot movements of said rocker arm translate said blade between said exposed and unexposed positions,

said foot operated means further including means for coupling said foot pedal to said rocker arm to translate movements of said foot pedal to rotations of said rocker arm for the ingress and egress of the saw blade through said blade slot, said cable mans including

an elongated cable having a first end attached to said foot pedal and a second end attached to said rocker arm, and

a plurality of pulleys defining a specific path that the cable must follow, a first one of said pulleys being mounted at the pivot point of said rotatable plate.

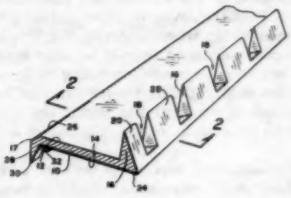
4,962,686

PERFORATING STRIP FOR PRINTING PRESSES

Harry Boyd, 500 Chautauqua, Norman, Okla. 73069, and David Boyd, 8411 S. Toledo, Tulsa, Okla. 74137

Filed May 27, 1986, Ser. No. 866,895
Int. Cl.[5] B26D 1/22
U.S. Cl. 83—678 2 Claims

1. A device which can be affixed to the impression cylinder of an offset or lithographic press or the like for forming perforations in paper passing through the press comprising an elongated, thin, metal strip having a base portion of generally rectangular cross-section with a flat upper surface and a flat lower surface and opposed first and second edges, the metal strip having integral teeth extending substantially perpendicular to the strip base portion upper surface along said first edge and said second edge of the base portion of the strip being curved from the lower surface to the upper surface providing a rounded outside radius edge which serves to substantially decrease the impression made in paper against which the strip is pressed, an integral pointed anchor downwardly extending



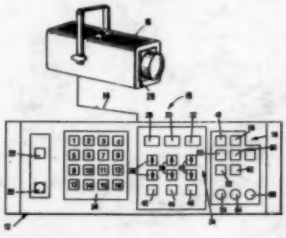
from said base portion lower surface at said second edge and including adhesive applied to the base portion lower surface by which the strip can be removably affixed to a printing press impression cylinder.

4,962,687

VARIABLE COLOR LIGHTING SYSTEM

Richard S. Belliveau, 2209 W. Braker La., Austin, Tex. 78758; Michael R. Floyd, 1111 W. 40th St., Austin, Tex. 78756, and Steven E. Tulk, 12014 Cabana La., Austin, Tex. 78727

Filed Sep. 6, 1988, Ser. No. 240,538
Int. Cl.[5] A63J 17/00
U.S. Cl. 84—464 R 26 Claims
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 168 Pages)



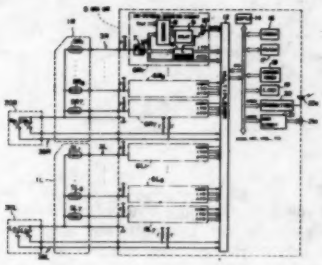
1. A variable color lighting system comprising lamp means for providing variable color lighting effects in response to input control signals, each such lamp means including a plurality of light source means, each adapted to provide light of a different color, intensity control circuit means for each said light source means operative to control and vary the intensity of a light source means in response to said input control signals and address circuit means operative to permit operation of said intensity control circuit means upon receipt by said address circuit means of a predetermined address signal, and remote central controller means operative to provide said input control and predetermined address signals to said lamp means.

4,962,688

MUSICAL TONE GENERATION CONTROL APPARATUS

Hideo Suzuki, and Masao Sakama, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed May 17, 1989, Ser. No. 353,441
Claims priority, application Japan, May 18, 1988, 63-65708 [U]; May 18, 1988, 63-121492; May 18, 1988, 63-121490
Int. Cl.[5] G10H *1/34*
U.S. Cl. 84—600 4 Claims



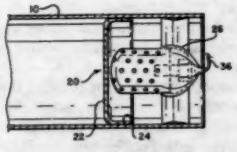
1. A musical tone generation control apparatus comprising:
(a) holding means having a shape which can be held by one hand of a person;
(b) a plurality of depression-pressure detecting means equipped to said holding means, said depression-pressure detecting means generating a pressure signal corresponding to a depression-pressure applied thereto by each finger of the hand of the person who holds said holding means, wherein said plurality of depression-pressure detecting means include at least a first detector and a second detector;
(c) angle detecting means for generating an angle signal corresponding to a bending angle at a joint portion of the person; and
(d) means for generating musical tone control data based on said pressure signal and said angle signal, said musical tone control data controlling musical tone generating apparatus which is externally provided,
wherein said first detector is used for inputting a first musical tone control parameter indicative of a key-on timing or touch information, while said second detector is used for inputting a second musical tone control parameter indicative of a tone color.

4,962,689

GAS GENERATOR MISSILE LAUNCH SYSTEM

Dzung V. Phan, Moorpark, and Kevin S. Minds, West Hills, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 1, 1989, Ser. No. 388,262
Int. Cl.[5] F41A *1/08*
U.S. Cl. 89—1.703 6 Claims



1. A missile launching system with substantially zero recoil force, comprising:
a container having an inner surface forming a continuous bore with forward and aft open ends, the bore forward end portion being dimensioned for enabling receipt of a missile therewithin;
a piston slidingly received within the container bore and sealingly contracting the inner surface of the container, said piston located substantially inwardly of the container aft end;
a gas generator axially mounted within the container bore inwardly of the container aft end and spaced from the inner surface of the container, said gas generator containing a supply of a given combustible propellant; and
a ring member mounted within the container bore and secured to the inner surface of the container between the gas generator and the aft end, said ring member defining a restricted circular throat of an area (A_t) which is less than the bore cross-sectional area (A_c) at the aft end;
said piston having an area (A_p) substantially the same as the bore cross-sectional area A_c at the aft end, and the ratio A_p/A_t has a value functionally related to the physical characteristics of the given propellant determined by solving

$$\frac{A_p}{A_t} = \frac{\Gamma(\gamma)\left(\frac{2\gamma}{\gamma-1}\left[1-\left(\frac{P_e}{P_p}\right)^{\frac{\gamma-1}{\gamma}}\right]\right)^{\frac{1}{2}}}{\left(1-\frac{P_e}{P_p}\right)}$$

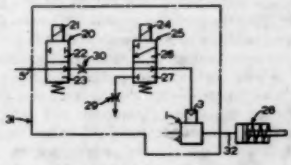
where P_p is the pressure in bore acting upon the piston, P_e is the pressure at the container bore aft end, and γ is the specific heat ratio for the given propellant.

4,962,690

RELAY-CONTROLLED VALVE

Johannes Möller, Wennigsen; Erwin Petersen, Wunstorf, and Johann Rothen, Sarstedt, all of Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 236,070, Aug. 24, 1988, abandoned. This application Aug. 25, 1989, Ser. No. 398,673
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1987, 3730778
Int. Cl.[3] F15B *13/043*
U.S. Cl. 91—459 20 Claims



11. A relay valve apparatus comprising:
(a) a control chamber positioned within said relay valve apparatus, said relay valve apparatus being activated by a fluid control pressure supplied to said control chamber and by a reduction of said fluid control pressure, said control chamber being connected for fluid communication with a fluid control pressure fluid communication line;
(b) an outlet chamber positioned within said relay valve apparatus, said outlet chamber connected for fluid communication at an outlet side thereof to a fluid pressure user circuit;
(c) said outlet chamber being connectable at an inlet side thereof to a fluid pressure supply source and an overpres-

sure free release space by means of a plurality of valve units; and

(d) a throttle arrangement positioned in said fluid control pressure communication line, a flow section A_{thr} of said throttle arrangement obeying the formula

$$A_{thr} \geq A_{VALVE} \cdot \frac{V_{CONTROL}}{V_{SYSTEM}}$$

wherein:

A_{VALVE} is the flow section of the valve units when fully open;

$V_{CONTROL}$ is the control chamber volume; and

V_{SYSTEM} is the user circuit volume.

4,962,691

MOUNTING STRUCTURE OF A MULTIPLE PISTON RING

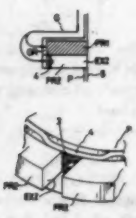
Mitsuhiro Kanao, 3-2, Chuou 1-Chome, Yakeyama, Kure-Shi, Hiroshima-Ken, Japan

Continuation of Ser. No. 249,329, Sep. 26, 1988, abandoned. This application Apr. 6, 1990, Ser. No. 506,599

Claims priority, application Japan, May 25, 1988, 63-128727

Int. Cl.[5] F16J 1/04

U.S. Cl. 92—208 **2 Claims**



1. A mounting structure of a multiple piston ring comprising:

a piston;

an annular groove formed on an outer surface of said piston;

a top circular piston ring disposed within the groove and having an end gap;

a second circular piston ring disposed within the groove with a top surface in abutment with a bottom surface of said top piston ring so that said rings are seated on each other, said second piston ring having an end gap spaced arcuately from the end gap in said top piston ring; and

a ring-shaped resilient member disposed within the annular groove between said second piston ring and said annular groove in said piston, said resilient member having a convex/concave profiled surfaced with said convex surface disposed immediately inside the end gap of said second piston ring for substantially the entire height thereof to block flow of gas due to combustion in an internal combustion engine utilizing said piston and ring mounting structure and to maintain the spacing of said end gaps.

4,962,692

ROOF RIDGE VENT

Lyle H. Sheert, 1034 Stratford Pl., Bloomfield Hills, Mich. 48013

Filed Jul. 31, 1989, Ser. No. 386,624

Int. Cl.[5] F24F 7/02

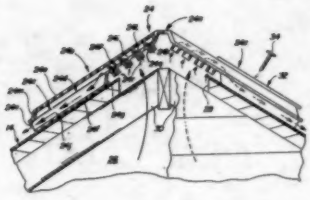
U.S. Cl. 98—42.21 **19 Claims**

1. A roof ridge vent adapted to be positioned along the central ridge of a double sloping roof to provide ventilation for the space underlying the roof, said vent including:

a central longitudinal hinge portion adapted to overlie the ridge of the roof;

left and right longitudinal vent portions joined to said hinge portion along their respective inboard edges and positioned at either side of said hinge portion;

means defining a plurality of parallel transverse passages in each vent portion extending from the outboard edge of the vent portion to a location at said hinge portion with each passage being defined by generally parallel side upper and



lower walls each extending transversely from the outboard edge of the vent portion to said hinge portion to define a tubular passage open at its outboard end and extending to said hinge portion; and

means defining vent openings in said lower wall of each passage proximate said hinge portion.

4,962,693

CENTRIFUGAL BREWING TYPE COFFEE MAKER

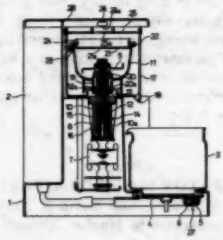
Yoshiyuki Miwa, Aichi, and Takashi Wada, Nagoya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Nov. 1, 1989, Ser. No. 429,980

Claims priority, application Japan, Nov. 2, 1988, 63-278295; Nov. 2, 1988, 63-278296; Jan. 17, 1989, 1-8169; Feb. 15, 1989, 1-35660

Int. Cl.[5] A47J 31/22, 31/42

U.S. Cl. 99—283 **10 Claims**



1. A coffee maker comprising:

(a) a brewing case for containing milled coffee beans, the brewing case having a filter provided at the outer periphery thereof for coffee brewing;

(b) a hot water feed mechanism including a heater, the hot water feed mechanism feeding hot water to the brewing case;

(c) an electric motor provided for rotating the brewing case so that a centrifugal force is applied to the hot water fed into the brewing case, thereby causing the hot water to pass through the milled coffee beans and then, through the filter; and

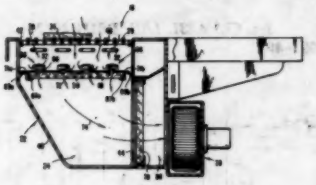
(d) control means for controlling the hot water feed mechanism and the motor so that the motor is driven to rotate the brewing case after the hot water feed is initiated from the hot water feed mechanism to the brewing case.

4,962,694

GRILL EXHAUST SYSTEM

James H. Graver, 70 Sycamore Rd., Carmel, Ind. 46032

Continuation-in-part of Ser. No. 182,255, Apr. 15, 1988, abandoned. This application Oct. 6, 1989, Ser. No. 417,835
Int. Cl.[5] A47J 37/00, 37/06
U.S. Cl. 99—339 17 Claims



1. A grill exhaust system for directing and exhausting a stream of fumes and particles created by cooking away from an apertured cooking surface comprising:

a main frame including a plurality of upwardly extending walls defining an exhaust plenum extending therebetween and a top opening for receiving the cooking surface;

a removable and replaceable flow diverter cartridge insertable in said plenum below the cooking surface and including,

a cartridge body having sides;

a flow diverter assembly within said cartridge body for inducing undulation in the exhaust stream including at least two substantially parallel spaced-apart overlying plates, each of said plates defining a plurality of exhaust vents wherein said exhaust vents are staggered relative to said exhaust vents in said substantially parallel plate therebelow and each immediately overlying plate defining a series of spaced covers for said exhaust vent immediately therebelow, said diverter assembly directing the stream downwardly from the cooking surface through said vents while inducing undulation so that the particles are separated from the stream and collect on said assembly while the fumes are exhausted therethrough;

a pair of outwardly projecting and mutually opposing flanges provided on said cartridge body, said flanges being present substantially continuously throughout the length of said sides;

supporting means provided on said main frame for removably receiving said opposing flanges;

access means for accessing said cartridge for removal from said frame; and

a fan unit for drawing the fumes downwardly through the apertured cooking surface.

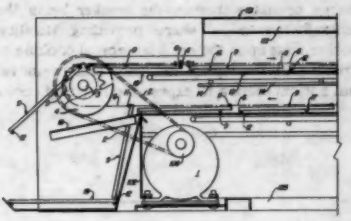
4,962,695

BROILER OVEN

Lynn L. Northrup, Jr., 1750 Americas Tower, 2323 Bryan LB 174, Dallas, Tex. 75201

Filed Jul. 27, 1988, Ser. No. 224,736
Int. Cl.[5] A47J 37/00
U.S. Cl. 99—339 11 Claims

1. An improved oven for broiling meat patties to be installed under a serving counter comprising housing means having a front end and a rear end, heating means positioned within said housing means, and moving means positioned within said housing means for moving a generally flat food portion having two principal sides in a generally horizontal direction over said heating means from the front towards the rear of said housing to expose one of said two principal sides of said food portion to said heating means and for moving said food portion under said heating means toward the front of said housing to expose the other of said two principal sides of said food portion to said heating means while retaining said food portion in its original directional orientation, said housing further having baffle means therein for configuring a portion of said oven into a plurality of zones, one of said zones encompassing said heating means to impart a first level of cooking heat to a food portion



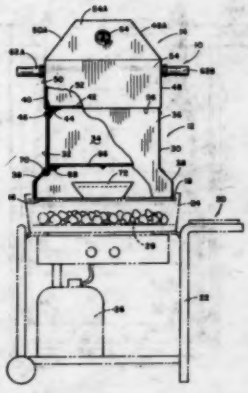
within said one of said zones and to impart a lower level of warming heat to a food portion within others of said zones not encompassing said heating means.

4,962,696

GRILL TOP SMOKER

Harold A. Gillis, Rte. 2, Box 23, Claremore, Okla. 74017

Filed Dec. 27, 1989, Ser. No. 457,274
Int. Cl.[5] A47J 37/04
U.S. Cl. 99—340 4 Claims



1. An improved smoker for use with a patio grill of the type having an open horizontal cooking surface and means below the cooking surface for producing heat such as by burning charcoal, an electric heating element or a gas fire, the smoker comprising:

a bottom section having an open horizontal bottom with a peripheral edge dimensioned to rest upon the open horizontal cooking surface of a patio grill and having opposed sides and end walls and an open horizontal top with a peripheral edge, said side walls at least in part flaring upwardly and inwardly whereby said open horizontal top is of less cross-sectional area than said open horizontal bottom;

a horizontal cooking grill supported on said bottom section adjacent said open top; and

a top section having an open horizontal bottom with a peripheral edge to rest upon and closely engage said bottom section top peripheral edge, the top section having closed side walls and end walls and dimensioned to provide a closed space to encompass food to be smoked resting on said horizontal cooking grill, and having a closed top, said

top sections side walls and end walls at least in part tapering inwardly and upwardly whereby said closed top is of less horizontal cross-sectional area than said top section horizontal bottom, the top section having smoke discharge openings therein, the smoker being thereby of generally pyramidal shape providing stability as the smoker rests upon the open horizontal cooking surface of a patio grill, the top section being easily removable from said bottom section to expose food on said cooking grill.

4,962,697

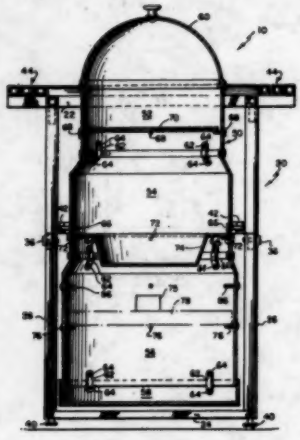
COMBINATION GRILLING AND SMOKING COOKER

Luther L. Farrar, 608 Green St., Auburn, Ala. 36830

Filed Feb. 6, 1990, Ser. No. 475,980

Int. Cl.[5] A47J *37/04, 37/06*

U.S. Cl. 99—340 **10 Claims**



1. A pivotable cooker for grilling and smoking food using a heating element comprising:

an outer housing having sides, a first open end, and a second open end, said first and second open ends capable of being above each other when used for grilling and smoking food, respectively;

means for pivoting said housing so that one of said first and second open ends can be disposed above the other when used for grilling and smoking food, respectively;

means for collecting drippings from said food when said cooker is used for smoking food detachably attached to said housing to cover said first open end;

first means for supporting food when said cooker is used for smoking food disposed within said housing, nearer said second open end than said first open end;

second means for supporting said heating element within said housing;

third means for supporting food when said cooker is used for grilling food disposed nearer said first open end than second open end; and

means for covering said second open end when said cooker is used for smoking food.

4,962,698

APPARATUS FOR REFINING OILS OR FATS

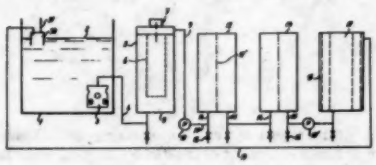
Jacob Drijftholt, Patrijsenhof 61, 1742 Be Schagen, and Johannes C. M. van den Berg, Kempenaar 03-03, 8242 BD Lelystad, both of Netherlands

Division of Ser. No. 222,863, Jul. 22, 1988. This application Dec. 26, 1989, Ser. No. 456,536

Claims priority, application Netherlands, Jul. 24, 1987, 8701760

Int. Cl.[5] A23L *1/01*; B01D *29/24*

U.S. Cl. 99—408 **3 Claims**



1. An apparatus for refining oils or fats comprising a heatable container and a filter system, said filter system having at least three stages, a first stage of the filter system comprising a rotating filter which, via a suction line, is in communication with the liquid content of the container and a suction pressure pump provided downstream of the filter, a second stage of the filter system comprising one or more surface filters arranged in series downstream of the suction pressure pump, and a third stage of the filter system comprising a microfilter with a pressure pump in the line between the second stage and the third stage.

4,962,699

DISTRIBUTING APPARATUS

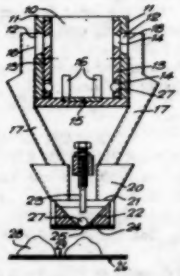
Gerd Karlsson, Loftahammar, and Kurt Wiebe, Bjuv, both of Sweden, assignors to Nestec S.A., Vevey, Switzerland

Filed Feb. 26, 1988, Ser. No. 160,778

Claims priority, application European Pat. Off., Feb. 28, 1987, 87102891.6

Int. Cl.[5] A23B *4/02*; A21C *9/04*

U.S. Cl. 99—450.1 **9 Claims**



1. An apparatus for distributing quasi-spherical objects onto food products comprising:

a vertically reciprocative horizontal table;

means for feeding food products onto and moving the food products along an upper surface of the table; and

a dispensing device positioned above the table for dispensing quasi-spherical objects onto the food products fed and moved along the upper surface of the table, the dispensing device of the apparatus comprising:

a trough in an upper portion of the dispensing device

having side walls and a base for receiving and containing a supply of the quasi-spherical objects to be dispensed on the food products and having at least one discharge opening in at least one side wall through which the objects may be discharged one object at a time;

a rotatable plate associated with each discharge opening being positioned inside the trough and having at least one aperture therethrough, each discharge opening associated with each plate being positioned and each plate and each aperture in each plate being positioned and configured such that, upon rotation of the plate, each aperture aligns with the associated trough discharge opening and such that each aperture receives one object at a time from the trough and transports the object to the associated discharge opening for being discharged one object at a time from the plate aperture through the associated discharge opening;

a chute associated with each discharge opening extending downwards towards the table for receiving and directing each object discharged from each discharge opening downwards towards the table;

a flexible strip positioned beneath each chute and extending horizontally above the table and having an aperture associated with each chute, the strip aperture being defined by a strip aperture border for receiving and supporting each object to be distributed onto a food product directed to the strip by each chute; and

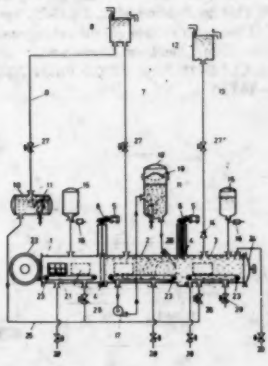
a vertically reciprocative pusher associated with and positioned above each strip aperture for forcing the object supported by the strip aperture border through the aperture onto the food product on the table.

4,962,700

APPARATUS FOR THE CONTINUOUS STERILIZATION OF FOODSTUFFS ARRANGED IN PARTICULAR IN CONTAINERS

Davor Skobic, and Ivo Kolin, both of Zagreb, Yugoslavia, assignors to Sour "Gavrilovic", Petrinja, Yugoslavia

Filed Jun. 15, 1989, Ser. No. 366,690
Claims priority, application Yugoslavia, Jul. 1, 1988, 1283
Int. Cl.[5] A23L *3/00, 3/04*
U.S. Cl. 99—470 **10 Claims**



1. Apparatus for the continuous sterilization of foodstuff batches, comprising a container horizontally disposed, said container having a preliminary chamber, an adjoining heat chamber communicating with sterilizing and cooling chambers, the chambers being separated from each other by separating doors movable up and down, and elevatedly arranged upper and lower hydrostatic chambers coupled to said preliminary, heat sterilizing and cooling chambers for controlling a constant operating pressure for carrying out sterilizing heating solely in hot water under pressure, wherein the heating chamber is connected via a conduit to the upper hydrostatic chamber for elevated hydrostatic pressure which in turn is connected via a conduit to an auxiliary heating vessel which is heated by means of a steam nozzle.

4,962,701

BEVERAGE CAN CRUSHER

Cecil J. Stralow, 14672 Brookstone Dr., Poway, Calif. 92064

Continuation-in-part of Ser. No. 386,654, Jul. 31, 1989, abandoned. This application May 7, 1990, Ser. No. 520,497
Int. Cl.[5] B30B *15/30*
U.S. Cl. 100—215 **4 Claims**

1. A beverage can crusher including wall-mountable magazine for holding a vertical row of cans disposed in stacked relation with their lengths horizontal for serial discharge downwardly via a lower can-exit end, and a wall mountable can-crushing mechanism disposed below and for receiving cans from the magazine unit, characterized in that the crushing mechanism and magazines are structurally separate units and the crushing unit comprises a unitary horizontal base in the form of an upwardly-facing channel having a horizontal bottom and configured to receive a can lying lengthwise therein, said base having an upright inner end integral with and rising from the base bottom and adapted for mounting on a wall and an outer end spaced from said inner end a distance greater than the length of a can lying on the base bottom between said ends, said outer end having pivot means integral with and rising from the base bottom and providing a transverse pivot axis spaced closely above the base bottom, a plunger having an inner can-engaging end and also an outer end and riding lengthwise of the channel between a retracted position in which said can-crushing end is spaced at least a can length outwardly from the base inner end to a crushing position in which said can-crushing end is closely adjacent to the base inner end for shortening the axial length of a can, a bell crank pivotally mounted to said pivot means and including a short arm having a pivotal connection to the outer end of the plunger and a long arm connected to said short arm at said pivot means and said long arm being adapted for manual operation, said bell crank having plunger-retracted position in which the long arm extends downwardly from said pivot axis and the short arm extends outwardly from said pivot axis, said bell crank being manually rockable about said pivot axis to move the plunger to its can-crushing position wherein the long arm moves upwardly and the short arm swings upwardly and inwardly and then downwardly and further inwardly as it passes an over-center position relative to the pivot axis.

4,962,702

SCREEN PRINTING MACHINES

Otto R. Eppinger, Parkdale, Australia, assignor to Reefdale Pty. Ltd., Braeside, Australia

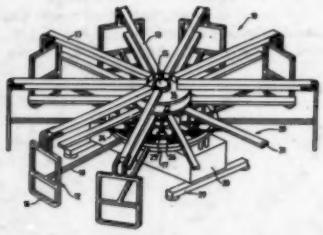
PCT No. PCT/AU88/00329, § 371 Date Apr. 10, 1989, § 102(e) Date Apr. 10, 1989, PCT Pub. No. WO89/01865, PCT Pub. Date Mar. 9, 1989

PCT Filed Aug. 26, 1988, Ser. No. 332,330

Claims priority, application Australia, Aug. 28, 1987, PI4030/87

Int. Cl.[5] B41F *15/36*

U.S. Cl. 101—114 9 Claims



1. A screen printing machine comprising

a fixed frame having a plurality of circumferentially spaced radially extending arms,

a complementary movable frame having a plurality of circumferentially spaced radially extending arms,

said movable frame being mounted for rotation relative to the fixed frame,

at least one print head assembly comprising:

a mounting frame operatively connected to one of said arms of the fixed frame:

a carriage operatively connected to the mounting frame and arranged for reciprocating movement relative thereto along a path of travel;

drive means for causing the reciprocating movement, the drive means comprising a piston/cylinder assembly including a cylinder having a longitudinal axis, and opposed ends, each end having a lateral axis extending laterally with respect to the longitudinal axis and a piston rod extending from one of those ends, a region defined between the lateral axes at respective ends of the cylinder, the lateral axes extending at right angles to the longitudinal axis of the assembly;

coupling means for operatively connecting the carriage to the piston rod and the carriage being arranged so that at least along part of its reciprocating path of travel the carriage is disposed within the region.

4,962,703

SELF SUPPLY AUTOMATIC INK STAMPING DEVICE

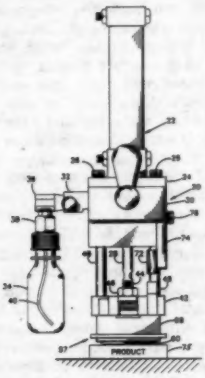
Alva J. Bishop, 3750 Greenbriar Dr., Zanesville, Ohio 43701

Filed Jul. 14, 1989, Ser. No. 380,007

Int. Cl.[5] B41K *1/38;* B41J *27/04*

U.S. Cl. 101—334 6 Claims

1. An automatic contact ink stamping apparatus for repetitive printing of selected indicia on selected workpiece comprising, in combination; (a) a base supporting a piston and cylinder assembly for reciprocal movement of a piston rod between extended and retracted positions; (b) an ink supply reservoir mounted on said base and including an exposed ink pad; (c) a carrier block fixed to the outer end of said piston rod for movement therewith; d) a die stamp assembly including a die stamping surface, said assembly being pivotally mounted to said carrier block about an axis perpendicular to the axis of said piston rod and spring biased to urge said die stamping surface toward a printing position facing the direction of said extended position of said piston rod in a plane perpendicular to the axis of said piston rod; (e) an ear provided on said die stamping assembly and pivotal therewith and including a selected cam following surface; (f) a cam pivot wheel provided with an axis parallel to the axis of rotation of said die stamp assembly and extending from said base in a position along the path of travel of said piston rod for engagement with said cam following



surface on said ear of said stamping assembly responsive to movement of said piston rod between extended and retracted positions to cause said stamping assembly to rotate between said printing position and an ink supply position defined with said die stamping surface rotated into substantial parallel facing engagement with said ink pad.

4,962,704

APPARATUS FOR ADAPTING A SINGLE SHEET FEED OFFSET DUPLICATOR TO PRINT AND COLLATE CONTINUOUS FORM PAPER

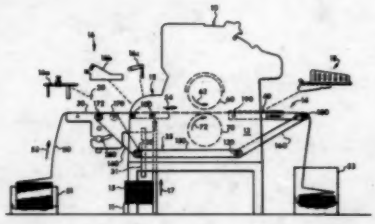
James M. Actor, Parker, Colo., assignor to Baldwin SPM, Inc., Fairfield, Ohio

Continuation-in-part of Ser. No. 192,201, May 10, 1988, Pat. No. 4,901,639. This application Mar. 22, 1989, Ser. No. 327,236

The portion of the term of this patent subsequent to Feb. 20, 2007, has been disclaimed.

Int. Cl.[5] B41F *5/04, 13/02;* B65H *20/20*

U.S. Cl. 101—142 20 Claims



1. An apparatus for modifying an individual sheet feed offset duplicator (10) to print impressions on continuous form paper (50), said duplicator having its sheet feed (16) removed from its input (12) and having its sheet delivery (18) removed from its output (14), said duplicator having a printing mechanism (60, 70) for printing said impressions on said continuous form paper and for pulling said continuous form paper through said duplicator, said apparatus comprising:

means (30) connected to said input of said duplicator and

engaging said paper for delivering said paper into said duplicator,

means (210, 220, 230, 240, 260) in said delivery means cooperative With the rotation of said printing mechanism for providing indexing to said paper as said paper is delivered through said duplicator so that said printed impressions on said paper is registered at a predetermined location,

means (282) in said delivery means for selecting said predetermined location while said duplicator is printing said impressions,

means (1100) in said delivery means for selectively changing said indexing for different page lengths in said paper,

means (40) connected to said output of said duplicator and engaging said paper for maintaining a predetermined amount of tautness on said paper by providing supplementary pulling on said paper as said paper is pulled through said duplicator by said printing mechanism,

means (270) in said delivering means and engaging said paper for generating power as said paper is pulled through said duplicator, said generating means further providing drag to said paper; said generating means having:

(a) a pair of elongated tractors (210) engaging punched holes (380) formed on the opposing margins (370) of the continuous form paper, said tractors being substantially equal in length to the longitudinal length of the page in said paper so that the margins of said paper including the punched holes are substantially supported by said tractors;

(b) a first rectangular plate (912) connected between said pair of elongated tractors and disposed slightly below said continuous form paper for supporting said paper; and

(c) a pair of elongated plates (1601 and 1602), each connected to the top of one of said elongated tractors (210) and disposed above said continuous form paper for holding said paper hn engagement with said tractors; and

means (35) connected to said duplicator and to said generating and said maintaining means for extending said power from said generating means to said maintaining means to provide the power necessary for said supplementary pull so that said tautness on said paper is created from said drag located at said input and said supplementary pull located at said output as said paper is pulled through said duplicator.

4,962,705

DAMPENER FOR AN OFFSET PRINTING MACHINE

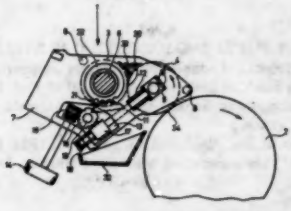
Walter D'Heureuse, Ladenburg; Hans-Jürgen Kusch, Neckargemünd; Gerhard Heppenstiel, Bammental, and Rudi Stellberger, Kronau, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Jun. 27, 1988, Ser. No. 211,978

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1987, 3720986; Apr. 23, 1988, 3813829

Int. Cl.[5] B41L *23/02, 25/02*

U.S. Cl. 101—148 **1 Claim**



1. A dampening unit for an offset printing machine, comprising a roller pair consisting of a metering roller, and a dampening form roller for applying dampening medium to a plate cylinder of the printing machine, said metering roller and said form roller being in mutually pressing engagement at a first contact zone along respective axially parallel lines on respective outer cylindrical surfaces of said roller pair, a gear drive for driving said roller pair with circumferential speeds of said metering roller and said form roller substantially in a downward direction in vicinity of said contact zone, and means defining a storage space for dampening medium located above said contact zone and including said outer cylindrical surfaces of said roller pair, only said metering roller of said roller pair being driven by a gear meshing with a drive gear of said gear drive, said form roller being driven solely by engagement via friction contact with said metering roller at said first contact zone in a first position of said form roller wherein said form roller is lifted away from said plate cylinder, and being in driven engagement solely via friction contact both at said first contact zone and at a second contact zone between said form roller and said plate cylinder in a second position of said form roller wherein said form roller is in engagement with said plate cylinder, and means for driving said metering roller at a circumferential speed which is increased to such an extent over that of said plate cylinder sufficient to compensate for braking moments applied to said form roller so that said form roller when in said second position rotates with a circumferential speed slower by an order of magnitude of 0.5 to 2% than the circumferential speed of said plate cylinder with consequent slippage between said form roller and said plate cylinder.

4,962,706

FUZE FOR ARTILLERY SHELL

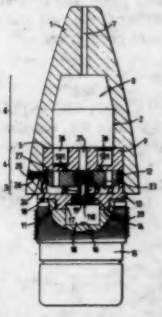
Stanley W. O. Ivermee, and Raymond G. E. Capnerhurst, both of c/o British Aerospace PLC, Manor Road, Hatfield, Herts, AL10 9LL, United Kingdom

Filed May 4, 1989, Ser. No. 347,138

Claims priority, application United Kingdom, May 4, 1988, 8810504

Int. Cl.[5] F42C *11/06*

U.S. Cl. 102—206 **5 Claims**



1. A fuze for an artillery shell, the fuze comprising:

electronic means for being programmed with a set of required data conditions, said electronic means including a comparator means for comparing the required conditions with a set of actual data conditions, and producing a detonation ignition signal when the required conditions are met;

an electrical storage battery for powering the electronic means;

first switch means for isolating the battery and the electronic means prior to launch of the shell and connecting the batttery and electronic means at a first predetermined time after launch of the shell; and

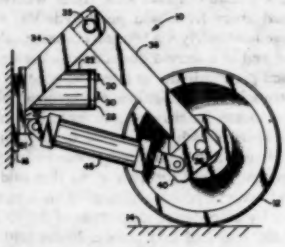
second switch means for connecting the electronic means to a detonator in the shell, at a second predetermined time after launch of the shell and for transmitting the detonation signal to said detonator, thereby initiating detonation of the shell.

4,962,707

APPARATUS FOR PRINTING UNIFORMLY, WITH TOTAL DIE CONTACT UTILIZING A PIVOTING DRUM AND TWO AIR CYLINDERS

Gary J. Claussen, 31 King Ave. #4, Billings, Mont. 59102

Filed Dec. 5, 1986, Ser. No. 938,502
Int. Cl.[5] B41F *17/00*
U.S. Cl. 101—212 6 Claims



1. Apparatus for printing which comprises:

a print drum having a raised image for printing disposed on the circumference thereof and having a central bore;

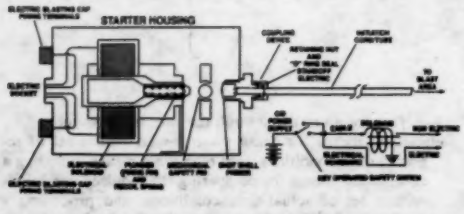
a shaft dimensioned for engagement with said central bore in said print drum; and means for swiveling to ensure said print drum maintains contact along substantially the entire axial extent thereof with even warped surfaces upon which printing is to occur which comprises a rotatably mounted plate; a scissor linkage supporting each end of said shaft, each scissor arrangement comprising pairs of spaced first and second pivotably connected arms, the opposite ends of said first and second pivotably connected arms being respectively connected to said shaft and said rotatably mounted plate; and first and second means for biasing the position of said first and second arms to vary the position of said print drum.

4,962,708

ELECTRIC/NON-ELECTRIC INITIATION SYSTEM

Richard N. Snyder, 8 Kristen Rd., Garrisonville, Va. 22463, and Percy R. Rainwater, 10031 Old Colchester Rd., Lorton, Va. 22079

Filed Dec. 12, 1988, Ser. No. 282,757
Int. Cl.[5] F42D *1/045*
U.S. Cl. 102—275.11 4 Claims



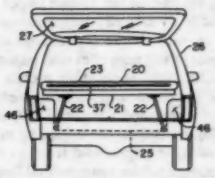
1. A high explosive detonation apparatus comprising initiating cord or tube, a shot shell primer containing an explosive charge, a solenoid actuated firing pin operable to strike said shot shell primer when actuated to ignite said explosive charge, means to couple said initiating cord or tube to said explosive charge to be ignited by the burning of said explosive charge, and actuating means positioned remotely from said solenoid actuated firing pin to actuate said solenoid operated firing pin from a remote position, said solenoid actuated firing pin being actuated by pulsed electrical energy, said actuating means including a key operated firing switch operable to apply said pulsed electrical energy to said solenoid actuated firing pin upon insertion of an operator's key.

4,962,709

AUXILIARY VEHICLE DECK

Roy L. Huber, 11609 Lehigh Ct., Plymouth, Mich. 48170

Filed Oct. 18, 1988, Ser. No. 259,052
Int. Cl.[5] A47B *23/00*
U.S. Cl. 108—44 10 Claims



1. An auxiliary vehicle deck assembly including a motor vehicle of the type having a floor, a pair of wheelhouses joined to opposite sides of the floor for enclosing the vehicle's rear wheels, a conventional front passenger seat and a removable rear passenger seat anchored to the floor, and a pair of recessed cylindrical members attached to the floor for releasably anchoring the rear seat to the floor, a generally rectangular thin laminated unitary deck having side margins which extend in the direction of the length of a rear cargo space of said vehicle and front and rear margins which extend in the direction of the width of said cargo space, and having a width which is substantially the same as the width of the rear cargo space and a length which is substantially the same as the length of said rear cargo space when said vehicle's rear seat is detached from said pair of recessed members attached to the vehicle's floor and removed from said vehicle, said laminated deck comprised of spaced apart upper and lower rectangular sheets, a vertical wall spaced slightly inwardly from the outer edges of said sheets to form a recess around the periphery of said deck for a molding, a cellular core between said upper and lower sheets and a resilient molding in said recess extending around the periphery of said deck; a pair of legs rotatably attached adjacent to the opposite side margins of said deck, each of said legs being adjustable about an axis parallel to a side margin of said laminated deck, outwardly away from a stored position adjacent to the underside of said deck to a downward operative position and adjustable inwardly toward said deck to said stored position adjacent to the underside of said deck; a means for rotatably attaching each of said legs to said laminated deck and a means for securing each of the legs to one of said recessed cylindrical floor members.

4,962,710

IMPACT-IMPEDING PANE/FRAME STRUCTURE

Siegfried Habicht, Leopoldshöhe; Rainer Reppert, and Eitel-Friedrich Höcker, both of Bielefeld, all of Fed. Rep. of Germany, assignors to Schuco International GmbH & Co., Fed. Rep. of Germany

Division of Ser. No. 7,063,637, Jun. 17, 1987, Pat. No. 4,879,957. This application May 18, 1989, Ser. No. 353,459
Int. Cl.[3] E06B *5/10*
U.S. Cl. 109—79 9 Claims

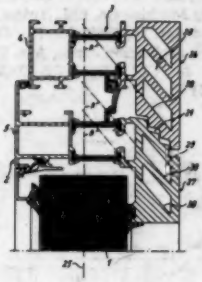
1. An impact-impeding structure, comprising

(a) a pane extending along a plane and having a front and a rear side;

(b) impact-impeding frame means for supporting said pane, said frame means including

(1) an outer frame including a first longitudinal impact-impeding section arranged on at least one side of said pane; and

(2) an inner frame arranged within said outer frame and including a second longitudinal section arranged on said one side of said pane coplanar with said first impact-impeding section; and



(c) said first and second longitudinal sections each having a stepped profile, said profiles being arranged opposite each other to define a labyrinthine gap therebetween, said first and second longitudinal sections each containing a plurality of chambers extending along the length thereof, said chambers being defined by lateral limiting surfaces arranged at an acute angle with respect to said plane.

4,962,711

METHOD OF BURNING SOLID FUEL BY MEANS OF A FLUIDIZED BED

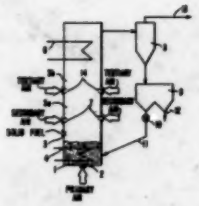
Yasuhiro Yamauchi, Nagasaki; Yoshihisa Arakawa, Tokyo; Yukihisa Fujima, Nagasaki; Kiyomasa Takenaga, Nagasaki, and Hirokazu Hiso, Nagasaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1989, Ser. No. 293,833

Claims priority, application Japan, Jan. 12, 1988, 63-3085

Int. Cl.[5] F23D *1/00*

U.S. Cl. 110—347 **2 Claims**



1. A method of burning solid fuel such as coal, oil coke, oil shale or the like by means of a fluidized bed, said method comprising the steps of:

feeding primary air through a primary air feed port into said fluidized bed so that the air ratio with respect to a theoretical amount of air required for complete combustion within said fluidized bed will be about 0.6–0.8;

feeding secondary air through a secondary air feed port into a free board downstream of said fluidized bed so that the air ratio with respect to a theoretical amount of air after charging of said secondary air will be about 0.8–1.0; and

feeding tertiary air through a tertiary air feed port opening into said free board at a position downstream of said secondary air feed port so that the air ratio with respect to a theoretical amount of air after charging of said tertiary air will be at least about 1.0.

4,962,712

DEVICE FOR DRAWING TOWEL CLOTH

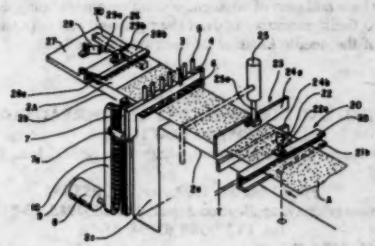
Kenichi Sotome, Tochigi, and Munetaka Nagasaki, Kadoma, both of Japan, assignors to SSMC Inc., Edison, N.J.

Filed Apr. 17, 1989, Ser. No. 338,689

Claims priority, application Japan, Jun. 7, 1988, 63-74794[U]

Int. Cl.[5] D05B *35/00*

U.S. Cl. 112—121.26 **7 Claims**



1. A device for drawing and cutting towel cloth from towel material having lengths of pile fabric longitudinally, each pair of adjacent lengths of pile fabric being separated by an intervening length of plain fabric, said device comprising:

first and second work tables integral with an automatic sewing machine body, the tables being disposed opposite and spaced apart from each other;

a separator disposed at an end of the first table remote from the second table to receive towel material supplied thereto, the separator blocking passage of the pile fabric lengths while passing therethrough the plain fabric lengths;

a cutting unit extending across the first table and disposed between the end of the first table adjacent the second table and the separator;

a towel cloth drawing unit extending over the space between the first and the second tables across the table cloth and movable vertically for drawing the towel cloth into the space between the tables;

a clamping unit mounted on a base plate which is disposed on the second working table and is movable thereon toward the first working table for clamping and drawing the towel cloth across said tables and said space.

4,962,713

PLURAL SEWING MACHINE ARRANGEMENT FOR SEWING BROAD CLOTH PIECES

Kozo Nakao, Wakayama, Japan, assignor to Queen Light Electronic Industries, Ltd., Wakayama, Japan

Filed Feb. 22, 1989, Ser. No. 313,635

Claims priority, application Japan, Nov. 24, 1988, 63-296568

Int. Cl.[5] D05B *21/00*

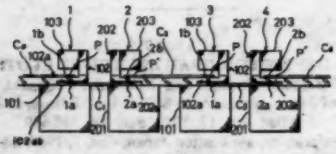
U.S. Cl. 112—155 **8 Claims**

1. A sewing apparatus for sewing broad cloth pieces, comprising:

a plurality of sewing machines aligned in a row so that the feeding direction of the cloths to be sewn is parallel, each sewing machine having a bed with an upper surface, an arm with a base end part formed coupled to said bed, and a needle location,

each said base end part having a shape, when viewed orthogonal to the feeding direction of the cloths, which approximates a Z-form possessing a partition wall, the upper

surface of which is parallel to the upper surface of said bed,



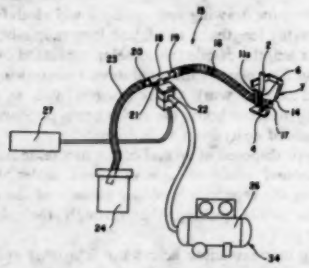
the base end part of adjacent sewing machines being coupled to their respective beds at the right and left opposite sides of the needle location of their respective beds.

4,962,714

THREAD END DISPOSAL UNIT IN A THREAD CUTTING SEWING MACHINE

Norio Komori, Tochigi, Japan, assignor to SSMC Inc., Edison, N.J.

Filed May 22, 1989, Ser. No. 355,932
Claims priority, application Japan, Jun. 21, 1988, 63-81859[U]
Int. Cl.[5] D05B 65/04, 65/06
U.S. Cl. 112—287 **3 Claims**



1. A thread end disposal unit for use in a thread cutting sewing machine which performs a succession of sewing operations, said thread end disposal unit comprising:

a head;

a needle bar vertically movably supported by the head, said bar having a tip end;

a needle disposed in the tip end of the bar and having a thread receiving hole;

a needle thread inserted in the hole, the thread having a starting length with a tip end and a rear end;

a presser bar mounted on the head adjacent the needle bar and provided with a cloth presser;

a thread end holder for holding the tip end of the starting length of the thread, the holder including a movable member having a hooked tip end, a bracket secured to the head and a stationary spring member having a base secured to the bracket, the stationary member being disposed opposite the movable member;

cutting means disposed at an underside of the cloth presser near a back thereof for cutting said starting length from a remainder of the thread as the sewing operations progress; and

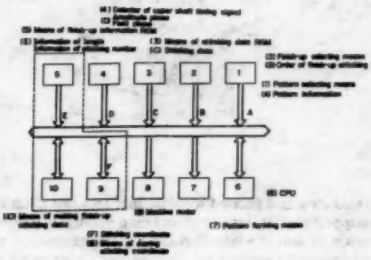
a thread end suction device provided with a first suction tube having a front open end positioned at the starting length of the thread held by the holder and a rear end, second suction tube having a front discharge end and a rear end disposed adjacent the rear end of the first tube, suction means including a Venturi-tube and an air compressor for generating a negative pressure, the suction means interconnecting the rear ends of the first and second tubes to cause the front end of the first tube to suck a cut away length of thread and to cause this length to pass through the both tubes for discharge from the front end of the second tube, and a container for recieving a discharged cut away length from the front end of the second tube.

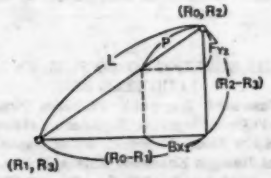
4,962,715

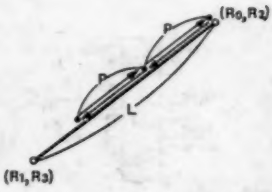
DEVICE FOR CONTROLLING FINISH-UP STITCHING IN AN ELECTRONIC COMPUTER SEWING MACHINE

Toru Hyodo, and Akira Orii, both of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 339,237
Claims priority, application Japan, Apr. 15, 1988, 3-91285
Int. Cl.[5] D05B 3/02, 27/22
U.S. Cl. 112—451 **8 Claims**







1. An electronic computer sewing machine for stitching a fabric according to stitching data, comprising means for selecting a stitching pattern; means for selecting a finish-up stitching; means for generating stitching data for the stitching pattern; pattern forming means for controlling an amplitude in a needle amplitude direction and a feeding amount in a feed direction of the fabric to be stitched in accordance with the stitching data; means for detecting an upper shaft phase of said sewing machine and outputting a value of the upper shaft phase; and a device for controlling the finish-up stitching which avoids unsightly stitching deformation, said finish-up stitching controlling device including finish-up stitching information generating means for generating a predetermined finish-up stitching length and stitching number, means for storing a plurality of

stitching coordinates for two successive different stitching positions, a finish-up stitching data making means for obtaining, before the finish-up stitching, a stitching direction from the stitching coordinates from said stitching coordinate storing means and generating an output in correlation with said means for selecting said finish-up stitching so as to define a direction opposite to a finish-up stitching direction, said finish-up stitching data making means also making finish-up stitching data according to the finish-up stitching length from said finish-up stitching information generating means, whereby a plurality of stitches are formed according to the stitching number from said finish-up stitching information generating means.

4,962,716

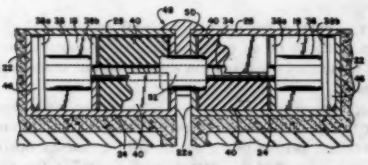
FLOATING DOCK HAVING SHOCK-ABSORBING COUPLING

Sig T. Fraasen, Estacada, and Wayne K. Dye, Jr., Oregon City, both of Oreg., assignors to Oregon Marine Floats, Inc., Oregon City, Oreg.

Continuation-in-part of Ser. No. 232,296, Aug. 15, 1988, Pat. No. 4,852,509. This application May 4, 1989, Ser. No. 347,022

Int. Cl.[5] B63B *35/38*

U.S. Cl. 114—263 **6 Claims**



1. A multi-element floating structure comprising:

(a) two or more floating dock sections which are positioned in end-to-end adjacency relative to one another;

(b) each of said dock sections having one or more cavities defined in the top surfaces thereof, one of said cavities being located proximate to and aligned with a mating cavity in each adjacent dock section;

(c) one or more elongate, unitary non-compressible tieing elements having stop elements permanently attached thereto proximate each end thereof;

(d) said cavities opening out of the ends of said dock sections so that one of said tieing elements can be placed into a mating pair of cavities with one of the stops on said tieing element being located in each of the cavities in said pair; and

(e) means for coupling each stop on said tieing elements to a respective dock section to prevent movement of said dock sections toward and away from one another.

4,962,717

MANEUVERING GEAR FOR SMALL BOAT

Yoshinori Tsumiyama, Miki, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

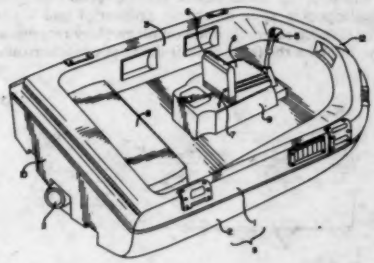
Filed Oct. 6, 1988, Ser. No. 254,304

Claims priority, application Japan, Oct. 7, 1987, 62-153542[U]; Oct 7, 1987, 62-153543[U]; Oct. 7, 1987, 62-153544[U]

Int. Cl.[3] B63H *25/00*

U.S. Cl. 114—144 R **5 Claims**

1. A maneuvering gear for a small boat, comprising a hull, a helm seat mounted on said hull, a control stick on said hull ahead of said helm seat, said control stick comprising an upper grip portion, an intermediate pipe portion, and a lower base portion, mounting means for supporting said base portion on the hull so that the stick is angularly turnable to the right or left in order to maneuver the boat to the right or left, said lower base portion having an opening therein and said pipe portion being removably attached in said base portion, lever means adjacent said grip portion on the top of said control stick, reel means movably mounted on said lower base portion adjacent



said pipe portion, and cable means connected to said lever means and removably connected to said reel means.

4,962,718

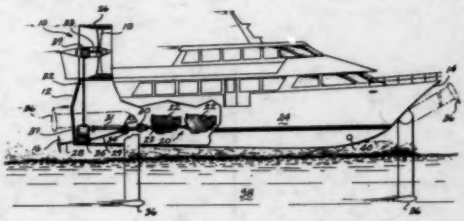
HYDROFOIL PROPULSION SYSTEM

Robert J. Gornstein, Vashon; Richard J. Rust, Westport; William Husa, Auburn, and Randolph J. Rust, Westort, all of Wash., assignors to Westfoil International, Wesport, Wash.

Continuation-in-part of Ser. No. 186,625, Apr. 27, 1988, abandoned. This application Mar. 7, 1989, Ser. No. 320,686

Int. Cl.[5] B63B *1/24*

U.S. Cl. 114—274 **9 Claims**



9. In a method for operating a hydrofoil watercraft in the transition from a waterborne mode to a foilborne mode, said watercraft having a motor means operably coupled to drive both a water propeller and an air propeller, said water propeller lifting from the water as said watercraft becomes foilborne, the improvement comprising automatically changing the pitch of the blades of the air propeller to absorb horsepower from the motor means as said watercraft becomes foilborne and the water propeller lifts from the water.

4,962,719

PROTECTIVE BOAT HULL DEVICE

Timothy R. Hughes, Rte. 5, Box 604, Reeds Spring, Mo. 65737, and Theodore A. Siebert, Jr., P.O. Box 7026, St. Louis, Mo. 63177

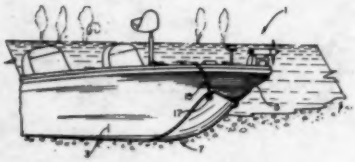
Filed Apr. 5, 1989, Ser. No. 333,533

Int. Cl.[5] B63B *43/00*

U.S. Cl. 114—343 **11 Claims**

1. A protective boat hull device to prevent damage to the hull of a boat during beaching, comprising a one-piece elongated flexible and waterproof flat sheet having a length substantially greater than the width thereof, said sheet being capable of being wound into a roll along the elongated length thereof for storage purposes, said sheet having self-centering means extending across the width at one end of said sheet for engaging the front bow of the boat above the water line in order to center said sheet underneath the hull of the boat below the water line and prevent hull damage during beaching of the

boat, said self-centering means including a V-shaped notch which extends inwardly within and across the width of the sheet at one end, said V-shaped notch being centered relative to the width of the sheet at one end of further including a connected opening at an innermost portion of said V-shaped notch for slidable assembly and complementary reception of a front eye hook on the front bow of the boat while surrounding



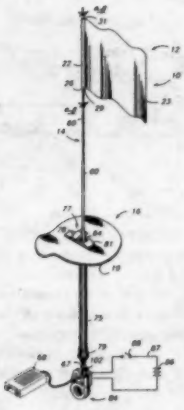
material areas adjacent said V-shaped notch engage the front bow of the boat above the water line to provide self-centering alignment of the sheet relative to the boat below the water line, and said sheet having fastening means for attaching said sheet to said boat, said fastening means being attached to opposite sides of said sheet adjacent said V-shaped notch to facilitate centering of said sheet relative to said boat.

4,962,720

MARINE SIGNAL FLAG

H. Pat Leffel, E. 1245 Crystal Bay Rd., Post Falls, Id. 83854

Filed Sep. 5, 1989, Ser. No. 402,829
Int. Cl.[5] G09F *17/00*
U.S. Cl. 116—173 **10 Claims**



1. A self storing signal flag for subsurface mounting to a support surface, comprising:

a retractable standard having telescoping standard sections extendable to an operative exposed elongated condition and retractable to a shortened storage condition;

a connector member including a top end and a bottom end loosely receivable over a portion of the standard to enable at least a portion of the standard to be retracted into the connector member between the top and bottom ends thereof;

a fitting on the connector member for securing the connector member to the retractable standard;

a flag body formed of a flexible material and including a leading edge securable to the connector member, and a trailing edge; and

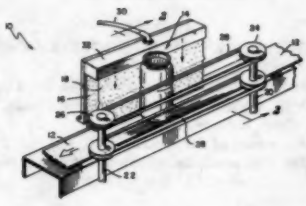
a surface mounting means for mounting the retractable standard and flag body to the support surface with the flag body and the standard situated underneath the supported surface when the standard is retracted to the shortened storage condition thereof.

4,962,721

APPARATUS FOR COATING A CONTAINER WITH A LIQUID

William J. Peek, Lithonia, Ga., assignor to Sewell Plastics Inc., Atlanta, Ga.

Filed Dec. 8, 1988, Ser. No. 281,403
Int. Cl.[5] B05C *1/02*
U.S. Cl. 118—209 **17 Claims**



1. An apparatus for applying a uniform liquid coating to selected portions of an outer surface of an object having a convex horizontal cross section and a constant vertical profile comprising:

an application pad acting as a liquid reservoir means and further having an application surface contoured to mirror a vertical profile of an object with a convex horizontal cross section and a constant vertical profile, the application pad having a lower portion extending below the application surface to form a pool storage means for containing excess liquid;

transporting means for transporting the object above the application pad lower portion in a rolling contact with the application surface sufficient to ensure uniform application of the liquid to the surface of the object without substantial deformation of the application pad surface;

a support means for maintaining the application pad in an orientation such that rolling contact with the surface of the object is maintained; and

means for supplying a liquid to the application pad, said liquid being supplied in an amount sufficient to wet the application surface of the application pad and uniformly dispense liquid to the outer surface of the object.

4,962,722

ADJUSTABLE PROTECTION SHIELD FOR PREVENTING COATING OVERSPRAY ON A BUILDING'S SURFACE

Darrow D. Thompson, 3590 Colony Ct., Placerville, Calif. 95667

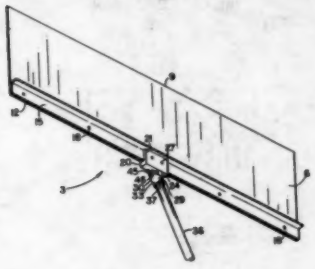
Filed Jul. 13, 1989, Ser. No. 379,082
Int. Cl.[5] B05C *21/00*
U.S. Cl. 118—504 **2 Claims**

1. An adjustable blade holder for use with a protection shield device employed for preventing a coating material from being applied to a non-designated surface area of a structure, comprising:

(a) a first hinge component having a blade anchoring member for reversibly securing a protection blade and a first hinge mate member projecting from said blade anchoring member and

(b) a second hinge component comprising a handle/extension handle attachment member, for holding by a user and reversibly attaching an extension handle, that extends into a second hinge mate member, wherein said first hinge component and said second hinge component are adjustably connected by contacting a mating surface on each of

said first and said second hinge mate members and securing at a desired angular position with a hinge fastening means, wherein said hinge fastening means is a hinge fastener bolt running from said first hinge mate member and through said second hinge mate member and secured



by a hinge fastener nut and each of said mating surfaces of said first and said second hinge mate members is a non-slip surface which resists a change in said secured angular position, wherein said non-slip surface comprises a set of teeth with each crest and trough directed radially outward from said hinge fastener bolt.

4,962,723

IMAGE FORMING APPARATUS UTILIZING PLURAL ELECTRIC FIELD GENERATING ARRANGEMENTS SO AS TO DEPOSIT DEVELOPER PARTICLES SUPPLIED FROM A DEVELOPER CHAMBER

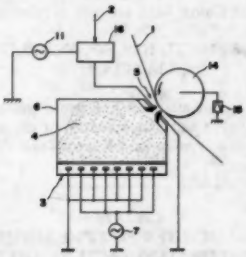
Hideo Hotomi, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 6, 1989, Ser. No. 294,128

Claims priority, application Japan, Jan. 8, 1988, 63-2775

Int. Cl.[5] G03G *15/08*

U.S. Cl. 118—654 **10 Claims**



1. An image forming apparatus for forming a developing powder image onto a recording medium comprising:

a chamber for accommodating a developing powder and having an opening confronting the recording medium;

first electric field generating means for generating an electric field curtain force in the chamber so as to suspend the developing powder in a cloud, whereby said suspended developing powder is charged;

second electric field generating means for generating an electric field curtain force which is variable so as to selectively move the suspended developing powder onto the surface for the recording medium, said second electric field generating means being provided in the vicinity of the opening; and

controlling means for controlling the intensity of the electric field being generating by the second electric field generating means according to an image signal so as to selectively move the suspended developing powder onto the surface of the recording medium.

4,962,724

INSTALLATION FOR SPRAYING COATING PRODUCT, NOTABLY WATER-SOLUBLE PAINT

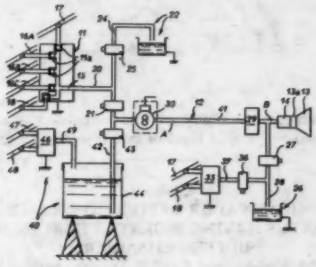
Eric Prus, and Adrien Lacchia, both of Grenoble, France, assignors to Sames S.A., Meylan, France

Continuation of Ser. No. 232,098, Aug. 15, 1980, abandoned. This application Aug. 14, 1989, Ser. No. 393,871

Claims priority, application France, Aug. 14, 1987, 8711577; Oct. 7, 1987, 8713855; Jul. 1, 1988, 8808944

Int. Cl.[5] B05B *5/16, 5/053*

U.S. Cl. 118—688 **30 Claims**



1. An installation for electrostatically spraying conductive coating products comprising:

(a) a grounded coating product change unit;

(b) at least one distribution pipe on a downstream side of said coating product change unit;

(c) at least one electrostatic sprayer for said coating product fed by said at least one distribution pipe;

(d) an intermediate coating product storage tank constituted by a section of said distribution pipe;

(e) insulated rinsing product feed means;

(f) electrically isolating means by which said coating product change unit is connected to said intermediate coating product storage tank; and

(g) selective connection means such as to propel coating product by rinsing product from said insulated rinsing product feed means during electrostatic spraying of said coating product.

4,962,725

APPARATUS FOR PRODUCING METAL-FREE STRIPS ON VACUUM-COATED FILM WEBS, PARTICULARLY TO BE USED WITH CAPACITORS

Jochen Heinz, Linden-Leihgestern; Thomas Krug, Hanau; Klemens Rubsam, Jossgrund; Hans Kessler, Hanau, and Siegfried Kleyer, Hainburg, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Sep. 28, 1989, Ser. No. 413,637

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1989, 3922187

Int. Cl.[5] C23C *14/12*

U.S. Cl. 118—718 **6 Claims**

1. Apparatus for producing metal-free strips on vacuum coated film webs, comprising

a casing having a cover for sealing the casing pressure-tight,

a winding unit including guiding and tensioning rollers rotatably disposed between a pair of vertical plates,

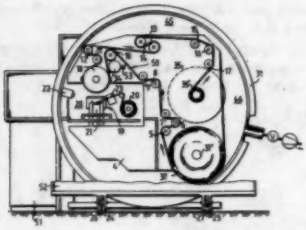
a coating roller,

a take-off roller,

a take-up roller,

an elongate vessel for receiving a separating agent to be evaporated at a certain level therein, said vessel being disposed substantially horizontally and transversely to the running direction of the web and having at least one vapor outlet pipe therein, said outlet pipe having an end inside

said vessel above said level of said separating agent and being connected to at least one opposed outlet nozzle in



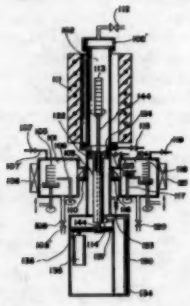
the immediate vicinity of said web, said nozzle being disposed below said level of said separating agent.

4,962,726

CHEMICAL VAPOR DEPOSITION REACTION APPARATUS HAVING ISOLATED REACTION AND BUFFER CHAMBERS

Yoshinari Matsushita, and Kenji Fukumoto, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 9, 1988, Ser. No. 268,929
Claims priority, application Japan, Nov. 10, 1987, 62-283516
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—719 **3 Claims**



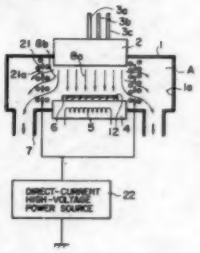
1. A CVD apparatus comprising:
a reaction chamber having an evacuation port connected to an evacuation means, a reaction gas inlet port connected to a reaction gas supply, and a heater for heating object wafers in said reaction chamber;
a buffer chamber connected in vertical continuity with said reaction chamber, and connected to an evacuation means and to an inert gas introducing means for maintaining the pressure of said buffer chamber higher than that of said reaction chamber and having an elevator on which a boat for holding said object wafers is rotatably mounted;
a valve provided on said boat elevator for gas-tightly isolating said reaction chamber and said buffer chamber during the CVD reaction;
a loading chamber for gas-tightly storing object wafers to be loaded into said buffer chamber and connected to said buffer chamber by a first gate and to an inert gas introducing means; and
an unloading chamber for gas-tightly storing object wafers after completion of CVD processing until removed to ambient atmosphere, and connected to said buffer chamber by a second gate and to an inert gas introducing means.

4,962,727

THIN FILM-FORMING APPARATUS

Shigeru Harada, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 19, 1989, Ser. No. 381,846
Claims priority, application Japan, Sep. 12, 1988, 63-229307
Int. Cl.[5] C23C *16/50*
U.S. Cl. 118—723 **5 Claims**



1. A thin film-forming apparatus comprising:
a reaction chamber;
holding means for holding an object for processing within said reaction chamber;
gas introduction means for introducing at least one reaction gas into said reaction chamber;
electrode means comprising an electrically conductive plate coated with an electrically insulating film and disposed within said reaction chamber for electrostatically capturing particles which do not contribute to the formation of a thin film on the object; and
a power source for applying a direct-current voltage to said plate.

4,962,728

USE OF POTASSIUM KURROL'S SALT TO PRESERVE LIVE FISH

Louis A. Highfill, Union, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 27, 1989, Ser. No. 329,175
Int. Cl.[5] A01K *61/00*
U.S. Cl. 119—3 **19 Claims**

1. A process for maintaining live fish in water wherein an alkali metal Kurrol's salt and a source of diverse ions in an amount sufficient to render said Kurrol's salt soluble are dissolved in said water.

4,962,729

INSULATED SHELTER FOR PET ANIMALS AND METHOD OF MANUFACTURE THEREOF

Aurelio F. Barreto, 4204 W. 137th St., Hawthorne, Calif. 90250, and Darrell R. Paxman, 21638 NE. 14th Pl., Redmond, Wash. 98053

Continuation of Ser. No. 156,449, Feb. 16, 1988, abandoned. This application Jan. 19, 1990, Ser. No. 471,053
Int. Cl.[5] A01K *1/03*
U.S. Cl. 119—19 **14 Claims**

1. A shelter for an animal comprising a molded unitary thermoplastic shell formed from a molten thermoplastic which has been cooled, said shell having an interior surface defining a cavity for sheltering said animal, said shell being formed of a solidified thermoplastic structural foam plastic having a solidified plastic foam core encased between inner and outer rigid plastic layers, said inner and outer rigid plastic layers being made of a similar plastic as said solidified foam core, said inner and outer rigid plastic layers being integrally formed with said solidified foam core, said inner and outer rigid plastic layers being denser than said solidified foam core, said structural foam being formed by heating a charge of thermoplastic under pressure until said thermoplastic charge is molten, releasing

and dispersing an inert gas into said molten thermoplastic charge, passing said molten thermoplastic charge into a mold shaped to form said shelter, reducing pressure on said thermoplastic charge to allow said inert gas to expand an interior of

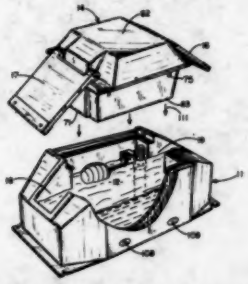
said thermoplastic charge, and permitting said thermoplastic charge to solidify to form said solidified foam core and said inner and said outer rigid plastic layers, said solidified foam core being encapsulated between said inner and said outer rigid plastic layers.

4,962,730

ANIMAL DRINKER

Kenneth L. Schafer, Rte. 3 Box 73, LeSueur, Minn. 56058

Continuation-in-part of Ser. No. 394,853, Aug. 17, 1964. This application Jan. 19, 1990, Ser. No. 467,207
Int. Cl.[5] A01K *7/06*
U.S. Cl. 119—73 16 Claims



1. An animal drinker comprising: tank means having generally upright wall means and bottom wall surrounding a chamber for accommodating water, said wall means having end walls with drinking well pockets open to the chamber and top of the end walls, top wall means mounted on the upright wall means covering said chamber, said top wall means having downwardly directed baffle means extended into the chamber and spaced inwardly from the upright wall means and above the bottom wall whereby water is located between the baffle means and upright wall means and in said pockets, said baffle means having a bottom edge located below the normal level of the water in the chamber and boss portions extended into the drinking well pockets providing the back walls of the drinking well pockets, means securing the top wall means to the upright wall means, means for supplying water to the chamber, said water flowing under the baffle means into said drinking well pockets, lid means for closing the drinking well pockets, and means pivotally connecting the lid means to the top wall means whereby the lid means normally close the top of said pockets and an animal can lift the lid means to provide access to the water in the drinking well pockets.

4,962,731

ANIMAL TOE NAIL COVERS

Toby Wexler, 458 'D' Heyman Blvd, Lafayette, La. 70503

Filed Jul. 24, 1989, Ser. No. 384,409
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—143 7 Claims

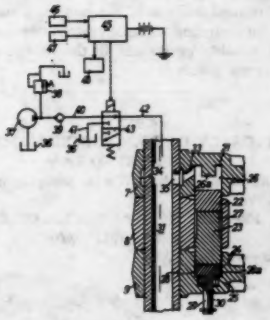
1. A covering for an animal toe nail, comprising:
(a) an elongated sheath of a certain length constructed of generally resilient material, at least on its gripping inner surface;
(b) a cavity extending throughout the length of the sheath, said cavity having a first open end, an edge having means for engaging against a side wall of an animal toe nail, and a second closed tip end;
(c) said elongated sheath defining a telescopic relation over an animal toe nail encasing and providing protection therefrom.

4,962,732

VALVE OPERATING DEVICE FOR INTERNAL COMBUSTION ENGINE

Kazuo Inoue, Tokyo; Masaaki Katoh, Saitama, and Noriyuki Kishi, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 218,549, Jul. 13, 1988, abandoned. This application May 2, 1989, Ser. No. 346,305
Claims priority, application Japan, Jul. 13, 1987, 62-174287
Int. Cl.[5] F01L *1/34*
U.S. Cl. 123—90.16 14 Claims



1. A method for controlling the operating of an internal combustion engine having a cylinder and fuel supply and intake and exhaust valves operatively associated with said cylinder and a hydraulically-operated valve operation mode changing mechanism to vary the mode of operation of such valves between low speed engine conditions and high speed engine conditions, comprising the steps of:
monitoring the speed of said engine;
monitoring the temperature of the working oil utilized in said valve operating mode changing mechanism;
preventing the valve operating mode changing device to shift the operation of said valves from a low-speed mode to a high-speed mode in response to the detection of a first

engine speed when a working oil temperature equal to or less than a predetermined value is also detected; and

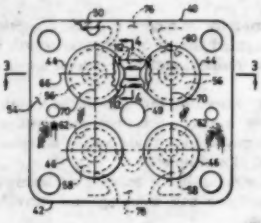
terminating the supply of fuel to said engine in response to the detection of a second predetermined value of engine speed when a working oil temperature equal to or less than said predetermined value continues to be detected.

4,962,733

DEVICE FOR REDUCING THERMAL RESTRAINT

Chi-Chung P. Cheung, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Sep. 29, 1989, Ser. No. 414,845
Int. Cl.[5] F02F *1/42*
U.S. Cl. 123—193 H **15 Claims**



1. An engine cylinder head having a deck, said deck having a high temperature fluid acting on at least a portion thereof subjecting said portion of the deck to a thermal load causing thermal expansion of said portion of the deck, said engine cylinder head including a plurality of passages therein extending from said deck, each of said passages being spaced from each other and each having a housing therearound, said deck further including a bridge connecting at least two of the housings: the improvement comprising;

said housings having a predetermined stiffness;

said bridge having a predetermined stiffness less than the predetermined stiffness of the housings; and

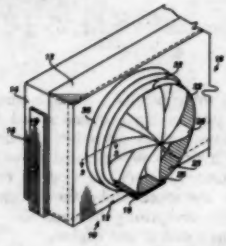
a device for reducing thermal restraint including at least a pair of notches positioned in the bridge and extending between the housings.

4,962,734

ELECTRICALLY DRIVEN, CIRCUMFERENTIALLY SUPPORTED FAN

Iser M. Jorgensen, Renton, Wash., assignor to Paccar Inc., Bellevue, Wash.

Filed Mar. 14, 1990, Ser. No. 493,510
Int. Cl.[5] F01P *7/10*
U.S. Cl. 123—41.49 **20 Claims**



1. A fan assembly for cooling air passing through a radiator, comprising:

a road vehicle having an engine, a radiator, and a liquid circulating between said radiator and said engine, said radiator being mounted such that air passes therethrough as said vehicle moves;

a fan support assembly coupled to said vehicle

a fan coupled to said fan support assembly and supported thereby, said fan having blades extending from a central region to the periphery of said fan, said fan including a fan ring coupled to the tips of said blades and extending circumferentially around said fan, said fan support assembly extending circumferentially around said fan and completely out of the path of airflow through said fan;

bearing means within said fan support assembly for supporting the weight of said fan; and

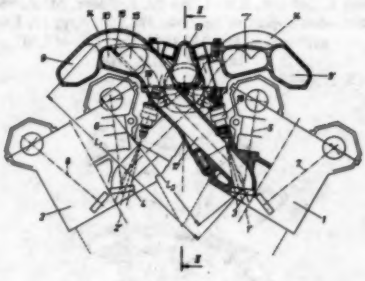
an electric drive means within said fan support assembly for electrically driving said fan.

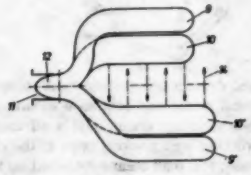
4,962,735

INTAKE SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINES

Bilek Andreas, Graz, Austria, assignor to AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof.Dr.Dr.h.c. Hans List, Graz, Austria

Filed Jan. 19, 1990, Ser. No. 467,247
Claims priority, application Austria, Jan. 20, 1989, 115/89
Int. Cl.[5] F02M *35/00*
U.S. Cl. 123—52 MV **5 Claims**





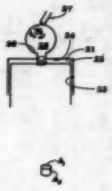
1. An intake system for multi-cylinder internal combustion engines of a V-type design, comprising suction pipes running in longitudinal direction of said combustion engine, said suction pipes are connected to intake channels leading towards intake valves of said multi-cylinder internal combustion engine by means of manifold passages, wherein two pairs of said suction pipes are provided, each said pair of suction pipes having a common inlet end, said pair of inlet ends are connected with a supply line, wherein only one control element is provided for selectively opening one of said inlet ends, a connection between one of said pairs of suction pipes and said intake channels being established by manifold passages of one length L_2, and that of the other pair of said suction pipes by manifold passages of a different length L_2.

4,962,736

DIESEL ENGINE

Noritaka Matsuo; Jun Tane, and Kazuo Miyazawa, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 1, 1989, Ser. No. 360,396
Claims priority, application Japan, Jun. 2, 1988, 63-134462
Int. Cl.[5] F02B 19/14, 19/08
U.S. Cl. 123—257 14 Claims



1. A diesel engine comprising means defining a main chamber that varies cyclically in volume during engine operation and which forms a main combustion chamber, a subchamber having a volume substantially smaller than the maximum volume of said main chamber, said subchamber communicating with said main chamber through a communication passageway, the varying of the volume of said main chamber effecting at times a flow through said communication passageway from said main chamber into said subchamber through a throat area that varies in size during the cyclic operation of said engine, fuel injection means for injecting fuel into said subchamber to initiate and maintain combustion, and means for effecting the beginning of fuel injection from said fuel injection means at a time when the effective area of said throat decreases to an area that is substantially equal to the effective flow area of said communication passageway.

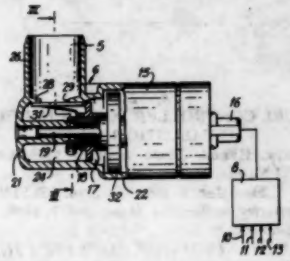
4,962,737

DEVICE FOR CONTROLLING AT LEAST ONE THROTTLE CROSS-SECTION AT A CONTROL OPENING

Günter Brand, Stuttgart; Hartmut Brammer, Vaihingen/Enz; Richard Gerber, Stuttgart; Otto Glöckler, Renningen; Gerold Grimm, Leonberg; Hans-Ulrich Gruber, Gerlingen; Dieter Günther, Murr; Jörg Isler, Stuttgart; Harald Kalippke, Benningen; Wolfgang Löhöffel, Ditzingen; Helmut Maurer, Vaihingen; Ulrich Mayer, Waiblingen; Günther Plapp, Filderstadt; Erhard Renninger, Markgröningen; Claus Ruppmann, Stuttgart; Harald Saller, Markgröningen, and Peter Werner, Wiernsheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE88/00238, § 371 Date Nov. 1, 1989, § 102(e) Date Nov. 1, 1989, PCT Pub. No. WO88/09435, PCT Pub. Date Dec. 1, 1988
PCT Filed Apr. 20, 1988, Ser. No. 432,735
Claims priority, application Fed. Rep. of Germany, May 19, 1987, 3716661
Int. Cl.[5] F02D 9/00
U.S. Cl. 123—339 5 Claims

1. A device for controlling a throttle cross-section of at least one control orifice in a bypass line extending around a throttle valve of an air intake pipe of an internal combustion engine, for regulating an idle speed of the internal combustion engine, said device comprising a throttle member having an initial position and movable relative to said one control orifice to define the throttle cross-section thereof; spring means for biasing said throttle member to the initial position thereof; and a positioning motor for moving said throttle member from the initial position of said throttle member against a bias force of said spring means; said throttle member, upon failure of said spring means and when said positioning motor is actuated, being movable to a position in which a safety cross-section in the bypass line is established and a quantity of operating medium flowing through said safety cross-section being less than a



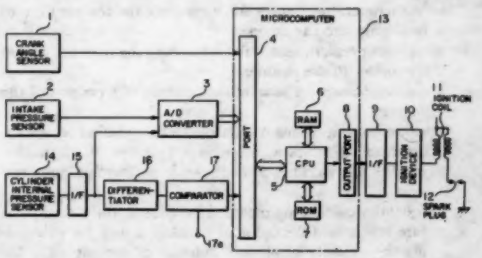
quantity of operating medium flowing through a complete cross-section of said control orifice whereby idle operation of the internal combustion engine is insured.

4,962,738

IGNITION CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Toshio Iwata, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1989, Ser. No. 412,956
Claims priority, application Japan, Sep. 27, 1988, 63-239743; Sep. 27, 1988, 63-239744
Int. Cl.[5] F02P 5/14, 5/145
U.S. Cl. 123—425 7 Claims



1. An ignition control system for an internal combustion engine having an engine cylinder and a crankshaft comprising:

rotational position sensing means for sensing the rotational position of the crankshaft and generating an output representative of the sensed crankshaft rotational position;

engine load sensing means for sensing an engine load and generating an output representative of the sensed engine load;

cylinder internal pressure sensing means for sensing the pressure in the engine cylinder and generating an output representative of the sensed cylinder internal pressure;

ignition timing determining means connected to receive the outputs of said rotational position sensing means and said engine load sensing means for determining appropriate ignition timing based on the sensed rotational position of the crankshaft and the sensed engine load at the time of normal operation of said rotational position sensing means, said ignition timing determining means being further connected to receive the output of said cylinder internal pressure sensing means for determining appropriate ignition timing based on the sensed cylinder internal pressure at the time of failure in said rotational position sensing means; and

igniting means connected to receive the output of said ignition timing determining means for igniting the engine at

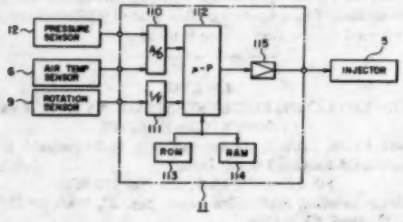
the ignition timing which is determined by said ignition timing determining means.

4,962,739

FUEL CONTROLLER FOR AN INTERNAL COMBUSTION ENGINE

Seiji Wataya, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1990, Ser. No. 461,514
Claims priority, application Japan, Jan. 7, 1989, 1-1619; Mar. 14, 1989, 1-63077
Int. Cl.[5] F02D 41/04, 41/30; F02M 51/00
U.S. Cl. 123—435 6 Claims



1. A fuel controller for an internal combustion engine comprising:

an air temperature sensor for measuring the temperature of intake air into the engine;

a cylinder pressure sensor for measuring the pressure within a cylinder of the engine;

a rotation sensor for sensing the rotation of a portion of the engine;

position sensing means responsive to the rotation sensor for determining when a piston in a cylinder of the engine reaches a prescribed position while performing compression;

air quantity calculating means responsive to the air temperature sensor and the cylinder pressure sensor for calculating the quantity of air in a cylinder of the engine at the prescribed piston position;

fuel supply calculating means responsive to the air quantity calculating means for calculating the amount of fuel to be supplied to the engine to obtain a prescribed air-fuel ratio; and

drive means for driving a fuel injector of the engine so as to supply the calculated amount of fuel to the engine.

4,962,740

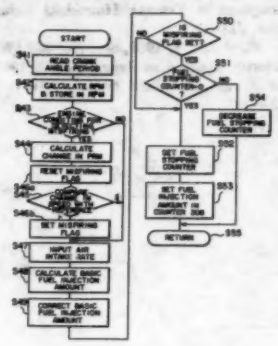
FUEL CONTROLLER FOR INTERNAL COMBUSTION ENGINE

Takanori Fujimoto, and Toshiro Hara, both of Himeji City, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1989, Ser. No. 399,144
Claims priority, application Japan, Aug. 29, 1988, 63-214328
Int. Cl.[5] F02D 41/22, 17/02
U.S. Cl. 123—481 7 Claims

1. A fuel controller for an internal combustion engine having a plurality of cylinders and a plurality of fuel injectors which individually supply fuel to the cylinders, comprising:

misfiring sensing means for sensing a misfiring in any one of the cylinders of the engine; and



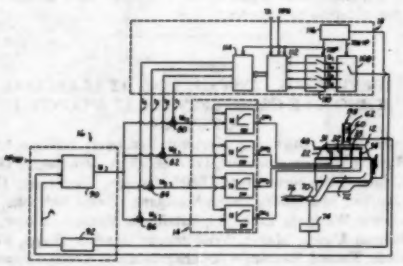
fuel supply cut-off means for cutting off the supply of fuel to the misfiring cylinder for a prescribed number of rotations of the engine.

4,962,741

INDIVIDUAL CYLINDER AIR/FUEL RATIO FEEDBACK CONTROL SYSTEM

Jeffrey A. Cook, Dearborn, and Jenny Grizzle, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 14, 1989, Ser. No. 380,062
Int. Cl.[5] F02D 41/14, 41/36
U.S. Cl. 123—489 14 Claims



1. A method for correcting air/fuel ratio for each of N cylinders via an oxygen sensor positioned in the exhaust of an internal combustion engine, comprising the steps of:

sampling the sensor once each period associated with a combustion event in one of the cylinders to generate N output signals;

storing each of said N output signals;

concurrently reading each of said N output signals from said storage once each output period to define N nonperiodic signals each being related to the air/fuel ratio of a corresponding cylinder wherein said output period is defined as a predetermined number of engine revolutions required for each of the cylinders to have a single combustion event;

generating N feedback correction signals from said N nonperiodic signals; and

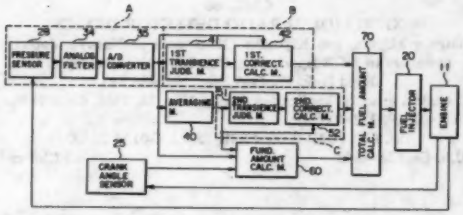
correcting a mixture of air and fuel supplied to each of the cylinders in response to each of said feedback correction signals for achieving a desired air/fuel ratio in each of the cylinders.

4,962,742

FUEL INJECTION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Hiroyuki Nishizawa, Kyoto; Kimito Kashiwabara, Kameoka; Osamu Nako, Okazaki; Mitsuaki Ishii, Himeji; Kouichi Yamane, Himeji; Masaaki Miyazaki, Himeji, and Ryoji Nishiyama, Amagasaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha and Mitsubishi Denki Kabushiki Kaisha, both of, Japan

Filed Jul. 7, 1989, Ser. No. 376,780
Claims priority, application Japan, Jul. 7, 1988, 63-169720
Int. Cl.[5] F02D 41/10, 41/12
U.S. Cl. 123—492 9 Claims



1. A fuel injection device for injecting a controlled amount of fuel into an air inlet passage to a cylinder of a spark ignition type internal combustion engine, said fuel injection device comprising:

pressure detector means for detecting an air pressure within the air inlet passage to the cylinder of the internal combustion engine, said pressure detector means outputting a pressure data corresponding to the detected pressure;

first increment calculation means for calculating an increment of the pressure data outputted from the pressure detector means over a first interval of time;

first comparator means, coupled to said first increment calculation means, for comparing with a first threshold level said increment of the pressure data over the first interval of time, so as to detect a first transient state of the internal combustion engine;

first correction amount calculation means, coupled to said first increment calculation means and first comparator means, for calculating, in accordance with a detection of the first transient state by the first comparator means, a first transient correction amount corresponding to said increment of the pressure data over the first interval of time;

averaging means, coupled to said pressure detector means, for averaging the pressure data outputted from said pressure detector means over each passage of an interval of time;

second increment calculation means, coupled to said averaging means, for calculating an increment of the averaged pressure data outputted from said averaging means, over a second interval of time which is longer than said first interval of time;

second comparator means, coupled to said second increment calculation means, for comparing with a second threshold level the increment of the averaged pressure data over said second interval of time, so as to detect a second transient state of the internal combustion engine;

second correction amount calculation means, coupled to said second increment calculation means and said second comparator means, for calculating, in accordance with a detection of the second transient state, a second transient correction amount corresponding to said increment of the averaged pressure data over the second interval of time;

fundamental amount calculation means, coupled to said pressure detector means, for calculating, on the basis of the pressure data, a fundamental amount of fuel that is to be injected by the fuel injection device;

total amount calculation means, coupled to said first and second correction amount calculation means and said fundamental amount calculation means, for calculating a total amount of fuel from said first and second correction amount and said fundamental amount; and

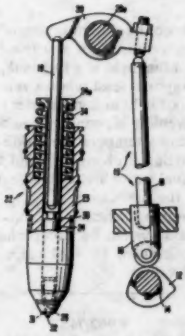
fuel injector means, coupled to said total amount calculation means, for injecting into the air inlet passage to the cylinder of the internal combustion engine an amount of fuel equal to said total amount of fuel calculated by said total amount calculation means.

4,962,743

INJECTION RATE CONTROL CAM

Julius P. Perr, Columbus, Ind.; Eric Liang, Peoria, Ill.; Robert C. Yu, and Amarjit S. Ghuman, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jun. 6, 1989, Ser. No. 362,266
Int. Cl.[5] F02M 39/00
U.S. Cl. 123—496 23 Claims

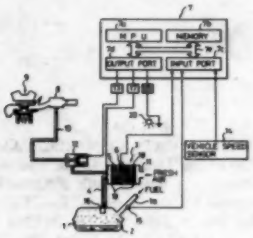


14. A cam for controlling the injection rate of fuel in a fuel injection system of an engine, the fuel injection system including a cyclically operating unit injector having a body, an injector plunger mounted for reciprocating movement in the injector body between an advanced position and a retracted portion to pump into the engine during each cycle a variable quantity of fuel up to a maximum quantity under rated engine conditions, and a drive train for converting rotational movement of said cam into reciprocating movement of the pumping plunger depending on the profile of said cam, wherein said cam profile comprises at least a plunger retraction segment and a plunger advancement segment for controlling the velocity of injector plunger retraction and advancement, respectively, said plunger advancement segment including a pre-injection subsequent shaped to cause an initial quantity of fuel to be injected into the engine during each cycle at rated engine conditions while said pre-injection subsegment is in contact with the drive train, and an injection subsegment following said pre-injection subsegment, said injection subsegment being shaped to cause injection of substantially all of the remaining portion of the fuel to be injected during each cycle at the maximum possible flow rate without exceeding the stress limits of said cam, wherein said injection subsegment is shaped to cause the velocity of said injector plunger to increase during an initial portion of said injection subsegment and to decrease during a final portion such that the highest injector plunger velocities are achieved before the midpoint of the injection subsegment.

4,962,744
DEVICE FOR DETECTING MALFUNCTION OF FUEL EVAPORATIVE PURGE SYSTEM

Kouji Uranishi, Susono, and Takaaki Itou, Mishima, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Aug. 18, 1989, Ser. No. 395,804
Claims priority, application Japan, Aug. 29, 1988, 63-112144[U]
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—520 11 Claims



1. A device for detecting a malfunction of a fuel evaporative purge system having a canister for absorbing fuel vapor caused by an evaporation of fuel held in a fuel tank, said purge system absorbing the fuel vapor at least when a vehicle is stopped, and purging the fuel vapor held in said canister to an engine of said vehicle when said vehicle is running, said device comprising:

means for detecting a temperature inside said canister;

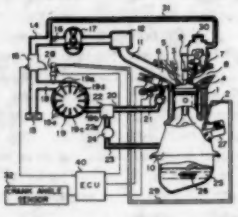
means for calculating a change of said temperature when absorbing the fuel vapor and a change of said temperature when purging the fuel vapor

means for determining whether or not a malfunction has occurred in said system by comparing said changes of temperature calculated by said calculating means with predetermined values.

4,962,745
FUEL SUPPLY DEVICE OF AN ENGINE

Eishi Ohno, and Norihiko Nakamura, both of Mishima, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 27, 1989, Ser. No. 413,215
Claims priority, application Japan, Oct. 4, 1988, 63-249086; Feb. 7, 1989, 1-26658
Int. Cl.[5] F02G *5/00*
U.S. Cl. 123—533 16 Claims



1. A fuel supply device of an engine having a crankcase, comprising:

an air blast valve for injecting fuel by pressurized air;

an air compressor for supplying pressurized air to said air blast valve via a pressurized air supply passage;

an oil supply means for supplying oil in the engine crankcase to said air compressor to lubricate said air compressor;

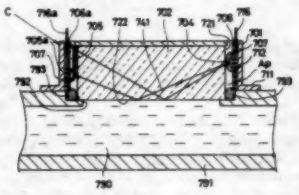
an oil separator arranged in said pressurized air supply passage to separate oil from pressurized air discharged from said air compressor and return said thus-separated oil to the engine crankcase via a return passage; and

a pressure regulator arranged in said return passage for discharging pressurized air and separated oil to said crankcase when a pressure in said pressurized air supply passage becomes higher than a predetermined pressure and for stopping the discharge of pressurized air and separated oil to said crankcase when said pressure in said pressurized air supply passage becomes lower than said predetermined pressure, to keep said pressure in said pressurized air supply passage at a constant value and to discharge said separated oil to said crankcase.

4,962,746
MIXING LIQUID RATIO DETECTOR DEVICE

Shigeru Miyata, and Kiyotaka Ohno, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Nov. 17, 1989, Ser. No. 438,513
Claims priority, application Japan, Nov. 23, 1988, 63-295478; Feb. 20, 1989, 1-40008
Int. Cl.[5] F02P *9/00*; F02B *75/12*; G01M *21/00*
U.S. Cl. 123—613 3 Claims



1. A mixing liquid ratio detector device comprising;

an optically permeable column, a bottom surface of which is brought in contact with a mixing liquid composed of at least two components, and forming a boundary between the mixing liquid and the bottom surface which is brought in contact with a mixing liquid;

a light emitting element located to face to one side of the optically permeable column;

a light receiving element located in the opposite relationship with the light emitting element in a manner to face to another side of the column with the column interposed therebetween;

light receiving area of the light receiving element and light emitting area of the light emitting element being each arranged in the neighborhood of the column in generally perpendicular relationship with the boundary between the mixing liquid and the column, such that light beams from the light emitting element enter the boundary through one side of the column, the light beams incident on the boundary at an angle more than a critical angle being totally reflected from the boundary, and advancing through an inner portion of the column to come out from the other side of the column, and impinging on the light receiving element so as to produce an output according to the intensity of the light beams impinged thereon.

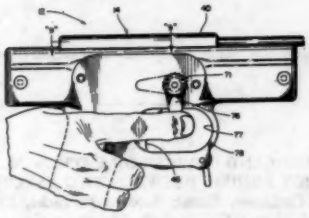
4,962,747
SPEARGUN TRIGGER MECHANISM

Alfred B. Biller, 263 Strathmore La., Bloomingdale, Ill. 60108

Filed Feb. 17, 1989, Ser. No. 311,045
Int. Cl.[5] F41B *7/04*
U.S. Cl. 124—40 10 Claims

1. A grip assembly for a fishing speargun, comprising: a grip housing having a handle, a trigger assembly removably received in the grip housing with a frame, said frame having guide means for receiving the proximal end of a spearpoint

shaft, a trigger pivotally mounted in the trigger frame, a latch bar pivotally mounted in the frame having a set position and a reset projection engageable by the spearpoint shaft proximal end as the shaft is inserted into the frame guide means, said latch bar also having a pawl when in its set position engageable with the shaft proximal end for holding the shaft in a set position in the guide means against the force of firing bands pulling on the shaft, said trigger being selectively operable to hold the latch bar in its set position and to release the latch bar as the trigger is pulled, a pivotal safety pawl selectively engageable with one of the trigger and latch bar to selectively prevent



movement of the latch bar from its set position, and a pivotal operator for the safety pawl positioned outside the grip housing having a radially extending projection constructed to be operated by the fisherman's trigger hand while on the grip handle, said operator projection being moveable directly adjacent the trigger so it may be operated by the fisherman's fingers on the trigger hand, said operator projection being spaced laterally from the trigger, said operator projection having a set position extending generally downwardly and a release position extending generally rearwardly so the front of the finger is used to release the safety pawl.

4,962,748

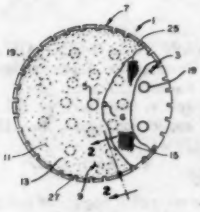
DIAMOND ABRASIVE SAW BLADE AND METHOD OF DRY SAWING CONCRETE

Karl B. Schweickhardt, 179 Spring Oaks Dr., St. Louis, Mo. 63011

Continuation of Ser. No. 118,858, Nov. 9, 1987, abandoned. This application Sep. 8, 1989, Ser. No. 405,100

Int. Cl.[5] B28D *1/04*

U.S. Cl. 125—13.01 **19 Claims**



1. A diamond abrasive saw blade for dry cutting of concrete, masonry, or the like, said saw blade comprising a flat, circular plate having a central mounting hole, a diamond abrasive matrix rim on the outer periphery of said plate, an abrasive coating secure at least one face of said plate for thermally isolating said plate against undue friction heat generated during dry sawing, the thickness of said abrasive coating and said plate being equal to or less than the thickness of said diamond abrasive matrix rim.

4,962,749

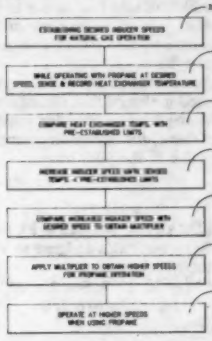
METHOD OF OPERATING A NATURAL GAS FURNACE WITH PROPANE

Daniel J. Dempsey, Carmel, and Kevin D. Thompson, Indianapolis, both of Ind., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 13, 1989, Ser. No. 435,904

Int. Cl.[5] F24H *3/00*

U.S. Cl. 126—116 A **6 Claims**



1. A method of using propane at a predetermined input rate in a burner of a furnace of the type designed for operation with natural gas at the same gas input rate and with a heat exchanger having a predetermined temperature limit and having its combustion air supply level controlled by selective regulation of the draft inducer motor speed, comprising the steps of:

establishing the desired draft inducer motor speed when natural gas is used in the burner;

applying to said desired speed a predetermined multiplier to obtain slightly higher speed and excess air levels for combustion; and

operating said draft inducer motor at said slightly higher speed when using propane in the furnace to thereby maintain the temperature in the heat exchanger below the predetermined temperature limit.

4,962,750

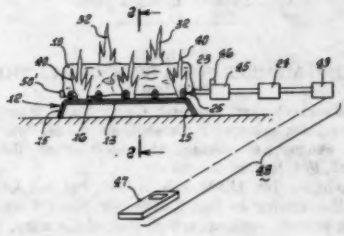
REMOTE CONTROL OF GAS FIREPLACE BURNER

Jon D. Bridgewater, Diamond Bar, Calif., assignor to R. H. Peterson Company, City of Industry, Calif.

Filed Nov. 6, 1989, Ser. No. 432,077

Int. Cl.[5] F24C *5/02*; F23Q *2/32*

U.S. Cl. 126—503 **22 Claims**



1. In an apparatus to light a fireplace that includes an elongated main gas burner associated with a grate for supporting logs, there being a valve operatively connected with the burner to control flow of combustible gas to the burner, the combination comprising:

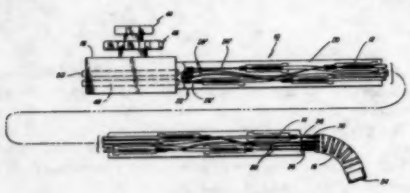
(a) first means including a pilot burner to produce a pilot flame for igniting gas flowing to the main burner;
(b) valve means operatively connected with the first means to
(i) control gas flow to said pilot burner and
(ii) control gas flow to said main burner;
(c) electrically operated control means responsive to remote transmission of RF or IR wave energy to effect flow of gas to said pilot burner by operation of said valve means, to effect operation of said first means to ignite said gas at said pilot burner, and to effect flow of gas to said main burner for ignition by said pilot flame in response to production of pilot flame,
(d) and an electrical continuity sensor circuit means operatively connected with said first means and with said electrically operated control means for sensing the existence of absence of flame, for controlling repeated attempts to ignite gas flowing to the pilot burner.

4,962,751

HYDRAULIC MUSCLE PUMP

Allan I. Krauter, Syracuse, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed May 30, 1989, Ser. No. 357,806
Int. Cl.[5] A61B *1/00*
U.S. Cl. 128—4 **7 Claims**



1. A borescope or endoscope having a flexible elongated insertion tube, an articulation section at a distal end of said insertion tube, and at least a first pair of steering cables for bending the articulation section in one place comprising:
at least one pair of liquid dynamic muscle means, each associated with their respective one of said steering cables in the distal end of said insertion tube;
at least one corresponding pair of liquid pump means disposed adjacent the proximal end of said insertion tube;
liquid conduit means extending from the proximal end of said liquid dynamic muscle means to the distal end of the corresponding liquid pump means for transferring liquid from one to the other; and
control means operatively connected to said pump means for selectively forcing liquid therefrom and into the corresponding liquid dynamic muscle means.

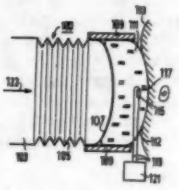
4,962,752

COUPLING MEMBER FOR A SHOCK WAVE THERAPY DEVICE

Helmut Reichenberger, Eckental; Georg Naser, Zindorf, and Helmut Jahn, Erlangen Buckenhof, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Division of Ser. No. 13,504, Feb. 9, 1987, Pat. No. 4,813,402.
This application Dec. 2, 1988, Ser. No. 279,106
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1986, 3608277; Aug. 18, 1986, 3627943
Int. Cl.[5] A61B *17/22*
U.S. Cl. 128—24 A **11 Claims**

1. An essentially homogeneous coupling member for the transmission of shock waves from a chock wave source to a patient to be treated, said coupling member consisting of a member formed of an essentially homogeneous, elastic, shape-stable material having moist outside surfaces, said member including a shock wave sensor being contained in the essentially homogeneous, elastic, shape-stable material of said member.

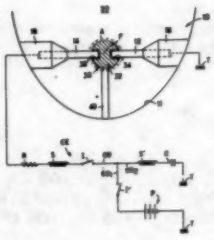


4,962,753

A METHOD AND DEVICE FOR IMPROVING THE DISCHARGE REGIME BETWEEN TWO ELECTRODES

Dominique Cathignol, Genas; Bernard Lacruche, Lyons, and Jean-Louis Mestas, Chassieu, all of France, assignors to Technomed International, Paris and Institut National de la Sante et de la Recherche Medicale (INSERM), Lyons, both of, France

Filed Jun. 15, 1988, Ser. No. 207,068
Claims priority, application France, Jun. 16, 1987, 87 08400
Int. Cl.[5] A61B *17/22*
U.S. Cl. 128—24 A **19 Claims**



5. The method of claim 1, wherein the medium is a liquid.

4,962,754

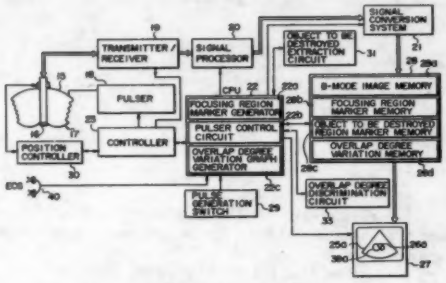
SHOCK WAVE TREATMENT APPARATUS

Kiyoshi Okazaki, Takanezawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 4, 1989, Ser. No. 293,284
Claims priority, application Japan, Jan. 13, 1988, 63-3824; May 27, 1988, 63-129731
Int. Cl.[5] A61B *17/22*
U.S. Cl. 128—24 A **7 Claims**

1. A shock wave treatment apparatus comprising:
shock wave generating means for forming a focusing region of a destruction shock wave for destroying an object in a subject to be examined;
image information acquiring means, arranged in a shock wave transmission region of said shock wave generating means, for acquiring tomographic image information of the subject to be examined and the object to be destroyed;
overlap degree discriminating means for calculating an overlap degree between said focusing region of the shock wave and the object to be destroyed; and
overlap degree variation information display means for

displaying a variation in overlap degree obtained, with the passage of time, from the calculated result, and used as



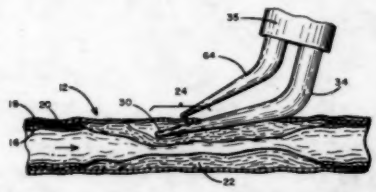
information for determining whether or not to generate shock waves by said shock wave generating means.

4,962,755

METHOD FOR PERFORMING ENDARTERECTOMY

Robert M. King, Minneapolis, and H. David Dalquist, Edina, both of Minn., assignors to Heart Tech of Minnesota, Inc., St. Louis Park, Minn.

Filed Jul. 21, 1989, Ser. No. 382,918
Int. Cl.[5] A61B *17/22*
U.S. Cl. 128—24 A **7 Claims**



1. A method of removing atherosclerotic plaque deposits from the interior of a blood vessel comprising the steps of:

(a) surgically exposing the segment of said blood vessel containing said plaque deposits;

(b) forming an incision through the wall of the blood vessel at a location between the proximal and distal ends of said plaque deposit;

(c) introducing an ultrasonically vibrated hand-held probe through said incision;

(d) manipulating said probe relative to the interface between said plaque deposit and the involved wall of said blood vessel to free said plaque deposit from the blood vessel tissue;

(e) sequentially removing the portions of said plaque located proximally and distally of said incision intact through said incision; and

(f) closing said incision with sutures, or performing a distal bypass graft.

4,962,756

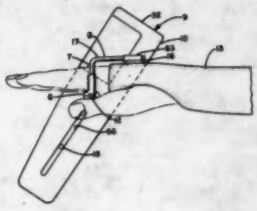
CONTINUOUS PASSIVE MOTION DEVICE FOR IMPARTING A SPIRAL MOTION TO THE DIGITS OF THE HAND

Dan Shamir, and Mark W. Groves, both of Columbus, Ohio, assignors to Danninger Medical Technology, Inc., Columbus, Ohio

Filed Feb. 9, 1989, Ser. No. 308,437
Int. Cl.[5] A61H *1/02*
U.S. Cl. 128—26 **6 Claims**

1. A device capable of being carried on the arm of a user for causing passive flexion and extension of a user's digit, said digit being a member of a hand having the lateral edge, said device comprising:

a motor driven actuator contained within a housing, said housing being operatively joined to support means for substantial support by the dorsal surface of the user's arm,



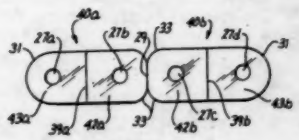
means linking said actuator with said digit, said actuator including means for causing a linear element of actuation and a rotational element of actuation such that the operation of the motor causes said actuator to drive said digit in a spiral about an axis of rotation.

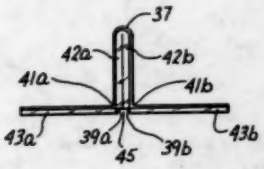
4,962,757

SUTURE LOOP FOR CATHETERS

Michael S. Stefan, Costa Mesa, Calif., assignor to Baxter International Inc., Deerfield, Ill.

Filed Feb. 28, 1989, Ser. No. 316,613
Int. Cl.[5] A61M *39/00*
U.S. Cl. 128—DIG. 26 **8 Claims**





1. A device for securing tubing to a patient by means of suturing, comprising:

an elongated strip having two ends and two sides with adhesive applied to one side, said strip having a first portion and a second portion, each portion having at least one hole formed therein and a channel formed on the adhesive side of the strip so that when the adhesive side of the strip is folded over the tubing and the ends are pressed together, the channels overlie each other forming a single channel within the adhesively joined strip to secure the tubing in place, and the holes overlie each other to provide a suture site.

4,962,758

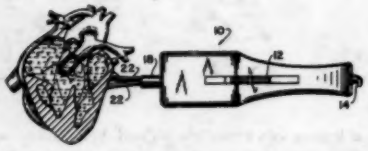
VIBRATORY DEVICE FOR RELEASING AIR BUBBLES TRAPPED IN THE HEART MUSCLE

Jeffrey Lasner, and Michael Lasner, both of 4 Baltusrol Dr., Purchase, N.Y. 10577

Continuation-in-part of Ser. No. 275,679, Nov. 23, 1988, abandoned, which is a continuation-in-part of Ser. No. 126,031, Nov. 27, 1987, abandoned. This application Jun. 9, 1989, Ser. No. 364,520

Int. Cl.[5] A61H *1/00, 7/00*

U.S. Cl. 128—41 9 Claims



3. A vibrating device for releasing air bubbles trapped in the heart muscle during open heart surgery comprising: an electrically operated oscillating unit, a pair of arms removably connected to said oscillating unit, a curved heart engaging support plate secured to said arms, said plate having a soft and pliable surface and a rigid backing member and conforms to the configuration of at least part of the heart, and an electrical power source for supplying current to said oscillating unit to thereby cause said arms and support plate to vibrate gently, thereby freeing said air bubbles from said heart.

4,962,759

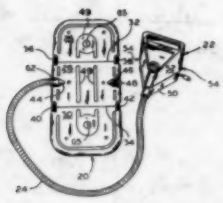
AIR BUBBLING MATS HAVING HEATED AIR FOR THERAPEUTICALLY AGITATING BATH WATER

Richard J. Stern, Chicago, and Donald J. Kempiak, Palatine, both of Ill., assignors to Associated Mills Inc., Chicago, Ill.

Filed Feb. 8, 1988, Ser. No. 153,146

Int. Cl.[5] A61H *9/00*

U.S. Cl. 128—66 5 Claims



1. A portable air bubbling mat assembly for temporary installation in body of water, said assembly comprising a mat means having air discharge holes therein for bubbling air through said body of water, an air pump means, an air hose coupled between said air pump means and said mat means, an electric motor in said air pump for driving air through said hose and out said air holes, safety means for protecting a user against electrocution if said motor is at least partially exposed to water, rope heater means woven on a spider support in said air pump means and protected by said safety means, said heater means heating said air before said air is driven through said air holes, means for mounting said spider support on said electric motor at a location which is most remote from any water which is associated with said bath mat, wherein said motor has an end cap with integral fingers extending therefrom, said spider is an insulating board with a central hole which is dimensioned to fit over said end cap, and a spaced parallel pair of slots extending away from said hole to fit over said integral fingers to prevent rotation of said spider.

4,962,760

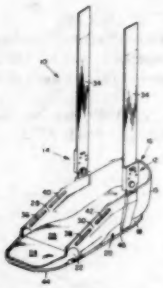
ORTHOPEDIC RESTRAINT APPARATUS

Robert W. Jones, San Antonio, Tex., assignor to Mesa, Inc., San Antonio, Tex.

Filed May 1, 1989, Ser. No. 345,563

Int. Cl.[5] A61F *5/00*

U.S. Cl. 128—80 F 1 Claim



1. An orthopedic restraint apparatus comprising:

a foot support member, said foot support member having a heel base, a midfoot portion and a toe member pivotally connected thereto, said midfoot portion having a generally flat, non-arcuate bottom surface with a thin, flat traction tread affixed to said bottom surface so as to provide full, flat contact of said midfoot portion with the ground during walking, said bottom surface extending from immediately behind said toe member of said foot support to immediately forward of said heel base of said foot support, said foot support member further having rigidly attached thereto a first and a second vertical riser, said risers extending upwardly from opposite sides of said support member;

first and second lower leg brace members pivotally attached at first ends to said first and said second risers, respectively, each of said brace members further comprising ankle joints capable of adjusting the flexion of said brace members;

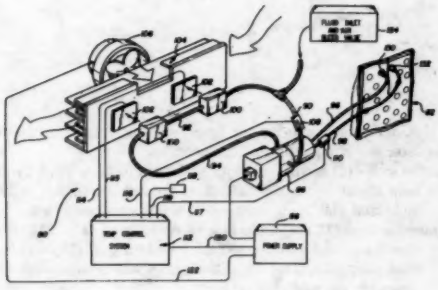
said toe member hingedly attached to a forward end of said foot support member and capable of flexion in the upward direction, said toe member further comprising male hinge portions on opposite sides of said toe member and said midfoot portion having female hinge portions positioned, for cooperative engagement with said male hinge portions, each of said male hinge portions further comprising upward and downward limiting shoulders, and each of said female hinge portions further comprising upward and downward abutting shoulders cooperating with said limiting shoulders to control the degree of downward flexion of said toe member such that the top edge of said toe member is limited to being substantially in parallel alignment with said generally flat, non-arcuated bottom surface of said midfoot portion of said foot support member.

4,962,761

THERMAL BANDAGE

Theodore A. Golden, 762 Wooddale Rd., Birmingham, Mich. 48010

Continuation-in-part of Ser. No. 81,115, Feb. 24, 1987, Pat. No. 4,846,176. This application May 4, 1989, Ser. No. 347,093
The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.
Int. Cl.[5] A61F 7/00
U.S. Cl. 128—400 7 Claims



1. A thermal bandage adapted to closely conform to the contours of a portion of a human body to heat or cool the adjacent skin area; said thermal bandage comprising:

a conforming member forming one side of said thermal bandage and including supple heat conducting material which readily conforms to the contour of said body portion such that said conforming member is in complete contact with said skin area permitting uniform distribution or extraction of heat from said skin area, and said conforming member including an outer thin pliable material surface which encloses said heat conducting material, and said outer pliable material surface having end portions;

a thermal pack mounted to said conforming member and forming an opposite side of said thermal bandage, said thermal pack being coextensive with the conforming member and said pack having means to heat or cool said conforming member;

a single boundary layer heat conducting surface interposed between said conforming member and said pack to separate said thermal pack and said conforming member and to facilitate the conduction of heat thereacross;

said heat conducting material includes a first heat conductive fluid contained between said thin pliable outer material surface and said single boundary layer heat conducting surface, said pliable outer material being fixed at its end portions to said thermal pack such that said first heat conductive fluid is in contact with said heat conducting single boundary layer surface and only said conforming member contacts said skin area;

said heating or cooling means providing for the circulation of a second heat conductive fluid under pressure through said thermal pack and over said single boundary layer conducting surface to either transfer heat to or extract heat from said first heat conducting fluid, said heating or cooling means including means for monitoring the temperature of the second heat conductive fluid for thermostatically controlling the temperature of the boundary layer surface, first heat conductive fluid, and said outer material surface so as to maintain a desired temperature at the skin area.

4,962,762

MODULAR SELF-CONTAINED ORTHOTIC DEVICE

Steven L. Beekil, 3333 W. Peterson, Chicago, Ill. 60659

Filed Feb. 21, 1989, Ser. No. 313,230
Int. Cl.[5] A61F 5/14
U.S. Cl. 128—595 10 Claims

1. A modular self-contained orthotic device for inexpensively and efficiently forming and casting an impression of the bottom portion of an individual's foot, the casting resulting therefrom in turn being utilized as an orthotic device for said individual, said device comprising:

self-contained foot enclosure means of a substantially lightweight elastic sock-like fabric having an internal side and an external side opposite to said internal side,

said foot enclosure means having an elastic upper portion and an elastic lower portion integrally attached thereto, said elastic upper portion configured so as to substantially and closely conform to and around the bottom of said individual's leg, and said lower portion configured so as to substantially and closely conform about the bottom of said individual's foot;

substantially liquid-tight housing means having longitudinal sides, an external surface and internal pocket means, said substantially liquid-tight housing means being operably positioned between said individual's foot and said internal lower portion of said foot enclosure means, with said internal pocket means being positioned below the bottom of said individual's foot;

substantially flexible impression means operably and preliminarily positioned within said internal pocket means of said liquid-tight housing means, said flexible impression means disposed to describe a substantially flat foot impression surface and a substantially flat base surface opposite said foot impression surface, wherein said foot impression surface may be operably positioned adjacent to the bottom of said individual's foot;

said substantially flexible impression means being impregnated with hardening agent means reactive to the introduction of a liquid medium to convert said substantially flexible impression means into a rigid impression member upon such introduction of said liquid medium;

conduit means operably attached to said impression means within said foot enclosure means, for channeling, as desired, quantity of said liquid medium, to in turn harden said substantially flexible impression means,

said conduit means further including propulsion means operably attached thereto for propelling said liquid medium through said conduit means and into said liquid-tight housing means;

said substantially flexible impression means hardening into a casting of said individual's foot bottom, as pressure is applied thereon by said individual, while said liquid medium reacts with said hardening agent means to solidify same into a solid cured orthotic member, without reliance upon rigid casting fixtures to accomodate same.

4,962,763

MAGNETIC RESONANCE IMAGE SYNTHESIZING SYSTEM

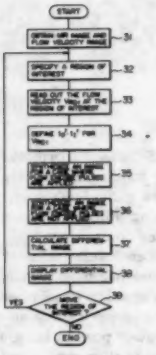
Shinichi Sato, Yokohama; Koichi Sano, Sagamihara; Tetsuo Yokoyama, Tokyo, and Hideki Koizumi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 22, 1988, Ser. No. 209,938

Claims priority, application Japan, Jun. 22, 1987, 62-153290

Int. Cl.[5] A61B *5/055*

U.S. Cl. 128—653 A **4 Claims**



1. A magnetic resonance image synthesizing system comprising:

means for generating a static magnetic field, a gradient magnetic field and a radio-frequency magnetic field;

means for applying said magnetic fields to an object to be examined having blood flow therein;

means for detecting nuclear magnetic resonance signals supplied from said object to be examined;

sequence control means for controlling the gradient magnetic field and the radio-frequency magnetic field generated by said magnetic field generating means and said detecting means;

means for constructing a magnetic resonance image according to a density distribution of nuclides in which the nuclear magnetic resonance occurs and a velocity distribution of blood flow within said object to be examined on the basis of the nuclear magnetic resonance signals detected by said detecting means;

means for displaying the magnetic resonance image constructed by said construction means;

means for specifying a region of interest in the magnetic resonance image displayed by said displaying means;

means for reading out a blood flow velocity at the region of interest specified by said specifying means from the velocity distribution of blood flow;

means for defining scanning parameters so as to produce a suitable image at a portion having the blood flow velocity read out by said reading means;

synthesizing means for synthesizing a magnetic resonance image on the basis of the scanning parameters defined by said defining means; and

means for making said displaying means display the synthesized magnetic resonance image.

4,962,764

HEMOSTATIC UNIT FOR MEASURING ARTERIVENOUS BLOODSTREAMS

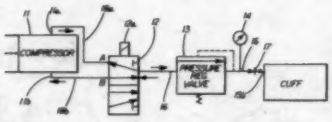
Mitsuma Matsumura, Tokyo, Japan, assignor to Nikki Co., Ltd, Japan

Filed Jul. 10, 1989, Ser. No. 377,331

Claims priority, application Japan, Sep. 2, 1988, 63-115015[U]

Int. Cl.[5] A61B *5/0295*

U.S. Cl. 128—691 **1 Claim**



1. A hemostatic unit for the determination of arteriovenous bloodstreams compriaing in combination:

a flat cuff (15) having a length sufficient to be wound by at least about one and a half turns around the region to be measured and being chargeable with compressed air;

pump means (11, 21) including an outlet port (11*a*, 21*a*) for supplying said compressed air into said cuff (15) and an inlet port (11*b*, 21*b*) for discharging said compressed air charged into said cuff (15);

pressure regulating valve means (13, 23) for regulating the pressure of said compressed air supplied to said cuff (15);

air supply/discharge circuit means interposed between said pump means (11, 21) and said cuff (15) and including said pressure regulating valve means (13, 33), and

changeover valve means (12, 22, 22') interposed between said pump means (11, 21) and said pressure regulating valve means (13, 23), said changeover valve means being selectively operable in a first position to connect said outlet port (11*a*, 21*a*) of said pump means (11, 21) with said cuff (15) and said inlet port (11*b*, 21*a*) of said pump means (11, 21) with atmosphere and in a second position to connect said outlet port (11*a*, 21*a*) of said pump means (11, 21) with atmosphere and said inlet port (11*b*, 21*b*) of said pump means (11, 21) with said cuff (15) so as to positively draw air from said cuff (15).

4,962,765

DIAGNOSTIC TEMPERATURE PROBE

Robert T. V. Kung, Andover; Timothy E. Moutafis, Gloucester, and Burt D. Ochs, North Andover, all of Mass., assignors to Abiomed, Inc., Danvers, Mass.

Continuation-in-part of Ser. No. 25,164, Mar. 12, 1987, Pat. No. 4,832,599. This application Mar. 11, 1988, Ser. No. 166,961

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—736 **16 Claims**

1. A clinical temperature sensing probe assembly comprising:

a shank portion which serves as a handle or as a connector for attachment to a handle, and

a tip portion extending from the shank portion, including

a first thin elongate member extending from the shank portion to a distal end, and

a thermally insulating penetrating tip extending from said distal end, said tip having a shape adapted for penetrating

a periodontal pocket to position a temperature sensing element therein, and

a temperature sensing element mounted at the end of the penetrating tip to be positioned in the pocket and sense temperature at a pocket location without inducing temperature perturbations.

4,962,766

NERVE LOCATOR AND STIMULATOR

Garrett D. Herzon, 1730 North Clark St., Apartment 3907, Chicago, Ill. 60614

Filed Jul. 19, 1989, Ser. No. 381,811
Int. Cl.[5] A61H *39/02*; A61N *1/36*
U.S. Cl. 128—741 2 Claims

1. A surgical nerve stimulator and locator which does not induce neuropraxia adapted to be used on a patient comprising, a handpiece, a first electrical lead connected to said handpiece and connectible to the patient's body, a second electrical lead connected to said handpiece and connectible to the patient's body to locate and stimulate nerves, a D.C. voltage source in said handpiece, a pulsed current source in said handpiece connected to said first and second electrical leads and to said voltage source, and a first two position switch connected to said pulsed current source and in a first position causing a pulse to be generated by said pulsed current source having a first pulse repetition rate and in a second position causing a pulse to be generated by said pulsed current source having a second pulse repetition rate, including a second two position switch connected to said pulsed current source and in a first position causing said pulsed current source to generate current pulses having a first amplitude and in a second position causing said pulsed current source to generate current pulses having a second amplitude, wherein said second electrical lead is enclosed by insulation material except at its end remote from said hand piece, including an indicator connected to said first and second electrical leads to indicate when current flows between them through the patient's body, and including a loudspeaker connected to said first and second electrical leads to aurally indicate when current flows between them through the patient's body.

4,962,767

PACEMAKER CATHETER

Robert R. Brownlee, Ormond Beach, Fla., assignor to Cardiac Control Systems, Inc., Palm Coast, Fla.

Continuation-in-part of Ser. No. 215,258, Jul. 5, 1988, abandoned. This application Apr. 4, 1989, Ser. No. 333,085
Int. Cl.[5] A61N *1/05*
U.S. Cl. 128—786 10 Claims

1. In combination, a cardiac pacemaker system having a catheter for insertion into a patient's heart, said catheter comprising:

a single, non-diverging, insulated filament for insertion into the patient's heart through the patient's vascular system, said filament having a distal end, a proximate end, and a proximal portion between said distal and proximate ends;

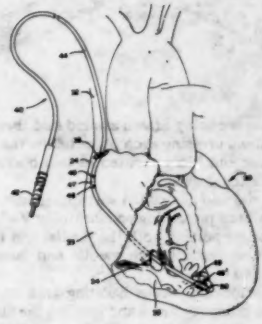
first electrode means disposed at said distal end of said filament for sensing and pacing the heartbeat of the ventricle of the patient's heart;

second and third longitudinally spaced electrode means disposed on said proximal portion of said filament and longitudinally spaced from said first electrode means and longitudinally spaced from each other from sensing atrial depolarizations having a particular signature indicative of the extracellular wave forms associated with the intracellular action potential in the atrium of the patient's heart;

first, second and third electrical conductor means in said catheter;

said first electrical conductor means within said insulated filament for connecting said first electrode means to the cardiac pacer; said second and third electrical conductor means connecting said spaced second and third electrode means to the cardiac pacer; and

particular longitudinal spacing means for adapting said second and third electrode means to sense and detect the signature indicative of the extracellular potential, as defined by a peak-negative to peak-positive deflection, being



propagated along the surface of the atrium of the patient's heart, whereby said second and third electrode means transmit input signals indicative of a heart bear p-wave to the cardiac pacer, the pacer including a pulse-generating unit for providing a stimulating electrical pulse to said first electrode in response to the input signals so as to pace the ventricle of the patient's heart, wherein said longitudinal spacing means comprise an insulating filament separating said second and third electrode means having a length substantially equal to the length of a peak-negative to peak-positive deflection of the detected extracellular signature associated with the action potential in the atrium of the patient's heart.

wherein said second and third electrode means comprise electrodes having dimensions adapted to minimize field averaging of a bioelectricwave front corresponding to the particular signature of the action potential traveling in the tissue medium of the patient's heart and

wherein the surface area of each of said second and third electrodes exposed to the potential transmitting tissue medium is from about 3 mm^2 to about 7 mm^2.

4,962,768

STIRRUP-LOCK ANKLE SUPPORT

Lawrence T. Strongren, 2916 Hillcrest, Hays, Kans. 67601, and George P. Kamau, III, Sterling, Va., assignors to Lawrence Thompson Strongren, Hays, Kans.

Filed Sep. 12, 1988, Ser. No. 243,263
Int. Cl.[5] A61F *5/00*
U.S. Cl. 128—80 H 5 Claims

1. An ankle support comprising:

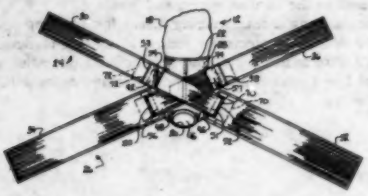
a tubular elastic sheath adapted to receive either ankle of a wearer and to be positioned over the ankle,

a pair of crossed, elongated elastic straps each having opposed first and second end portions, each of said straps comprising a pair of relatively elastic outer segments presenting said first and second end portions respectively and an intermediate stirrup segment made of elastic material with a relatively low stretch factor,

stretch locking means associated with each of said straps and interconnecting said outer segments with said intermediate stirrup segment,

means anchoring each of said crossed straps intermediate said stirrup segment thereof to said sheath on a bottom portion thereof adapted for disposition underneath the foot of a wearer,

fastener means on respective end portions of said straps,



said straps in use being drawn around said sheath into operative position, crossing each other below the ankle bone of the wearer and being secured in said operative positions by said fastener means,

said straps and said associated stirrup segments in their operative positions presenting an essentially V-shaped configuration for supporting both the medial and lateral sides of the ankle to restrict both medial and lateral movement thereof, and

said stretch locking means isolating said stirrup segments from said outer segments and limiting the elasticity of said stirrup segments to cause said stirrup segments to become substantially longitudinally inflexible below the ankle bone when said straps are drawn around the ankle into their operative positions.

4,962,769

USE OF BUBBLE PACKAGING FILM FOR RELIEVING DECUBITUS ULCERS OR PRESSURE ULCERS

Mario C. Garcia, West St. Paul, Minn., assignor to Prevent Products, Inc., St. Louis Park, Minn.

Continuation-in-part of Ser. No. 192,531, May 11, 1988, abandoned. This application Mar. 20, 1989, Ser. No. 326,087

Int. Cl.[5] A61F *13/00*

U.S. Cl. 128—889 **11 Claims**

1. Body fluid absorbing cushioning means for use by invalids and bed-ridden persons for absorption of body waste fluids and for relief of pressure areas on the skin of such persons, said fluid absorbing cushioning means comprising:

(a) a laminate with at least three layers including an inner water absorbent layer, an outer generally water impervious layer, and a center layer consisting of a fixed geometrical array of abutting enclosures defining air supported closed cells with each cell defining an enclosed space of predetermined volume;

(b) said fixed array including individual cells of said array of varying thickness and being disposed so as to reduce concentration of pressure forces upon predetermined areas of the body and skin surrounding the coccyx, trochanter and ischium areas of the body, and to transfer certain of the load from said predetermined areas to areas where bodily loading is normally lower than in said predetermined areas.

4,962,770

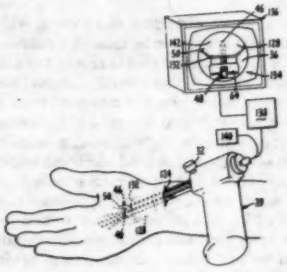
SURGICAL METHOD

John M. Agee, 3980 Bartley Dr., Sacramento, Calif. 95822, and Francis King, Shingle Springs, Calif., assignors to John M. Agee, Sacramento, Calif.

Division of Ser. No. 98,610, Sep. 18, 1987, abandoned. This application Jul. 14, 1989, Ser. No. 380,816

Int. Cl.[5] A61B *17/32*

U.S. Cl. 128—898 **19 Claims**



1. A surgical method for manipulating selected tissue in a body cavity under visual inspection, comprising:

(a) employing a surgical instrument comprising a probe having

(i) a flat upper surface, parallel sides, a convex lower surface, a generally closed distal end, and a lateral aperture in said upper surface and adjacent said closed distal end; wherein said distal end slopes away from said upper surface in a manner such that said distal end diverts displaceable tissue it contacts away from the region of the lateral aperture and said upper surface;

(ii) an optical system disposed at least partially within the probe, said system having a distal portion positioned adjacent the lateral aperture, thereby defining a viewing space between the distal portion of the optical system, and the distal end and the lateral aperture, said space located within the field-of-view of the optical system;

(iii) a working tool mounted within the viewing space capable of being extended from the viewing space through the lateral aperture;

(iv) means for extending the working tool outwardly from the viewing space and through the lateral aperture;

(v) a grip handle connected to said probe; wherein said handle includes actuator means for extending said working tool through said lateral aperture of said probe; and

(vi) adjustment means for adjusting the rotational orientation between said lateral aperture of said probe and said

grip handle; wherein said adjustment means is adapted to temporarily fix said rotational orientation;

(b) positioning the surgical instrument so that the lateral aperture is adjacent the selected tissue;

(c) extending the working tool through the lateral aperture to a position appropriate to manipulate the selected tissue; and

(d) manipulating the selected tissue, while avoiding inadvertent injury to surrounding tissue.

4,962,771

FILTER ASSEMBLY MACHINE CIGARETTE SAMPLING UNIT

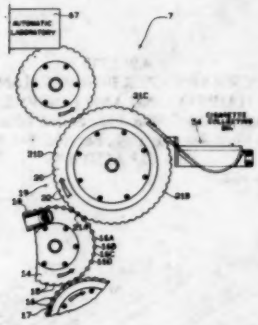
Armando Neri, and Paolo Andreoli, both of Bologna, Italy, assignors to G.D. Societa per Azioni, Bologna, Italy

Filed Mar. 16, 1989, Ser. No. 323,973

Claims priority, application Italy, Mar. 21, 1988, 3386 A/88

Int. Cl.[5] A24C 5/33

U.S. Cl. 131—282 **8 Claims**



1. In a filter assembly machine (7), a cigarette sampling unit for withdrawing cigarettes (16) of predetermined types off a line (17, 14, 18) extending through said machine (7) to advance in succession a predetermined number of types (16A, 16B, 16C, 16D) of cigarette (16) there along, the sampling unit being off said line (17, 14, 18), and being designed to cooperate with a cigarette feed conveyor (14) in the line (17, 14, 18), and comprising a sampling conveyor (20), which is located, in use, tangent to said feed conveyor (14), and which is provided with peripheral seats (21) for accommodating the cigarettes (16); at least one of said slats (21) being selected to provide with respective selectively operable suction means (49), the seats (21) being equal in number to the cigarette types (16A, 16B, 16C, 16D) or to a multiple thereof, and a selecting device (58) being provided for selectively activating said suction means (49) for selectively withdrawing cigarettes (16) of given types (16A, 16B, 16C, 16D) off of the feed conveyor (14).

4,962,772

FORMATION OF CIGARETTES INTO GROUPS

Alberto Manservigi, and Antonio Gamberini, both of Bologna, Italy, assignors to G.D. Societa per Azioni, Bologna, Italy

Filed Apr. 7, 1988, Ser. No. 178,638

Claims priority, application Italy, Apr. 24, 1987, 3444 A/87

Int. Cl.[5] A24C 5/32, 5/33

U.S. Cl. 131—282 **5 Claims**

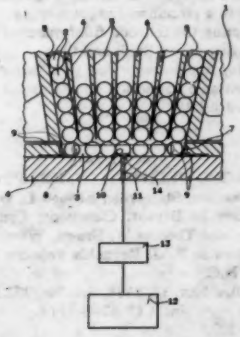
1. Apparatus for organizing cigarettes into groups, each consisting of at least one horizontal layer of cigarettes in which, in said layer, all of the cigarettes have a given diameter and are arranged side by side with their longitudinal axes parallel to one another,

said apparatus comprising:

in infeed hopper including a plurality of laterally spaced generally vertical walls having respective lower ends, and a horizontal shelf having an upper surface disposed directly under said lower ends of said vertical walls, with vertical spacing between said ends and said surface approximating said given diameter of each cigarette thereby defining a space suitable to be occupied by one horizontal layer of cigarettes; each respective neighboring two of said vertical walls defining between them a respective downwardly open channel suitable to be occupied by a respective generally vertical column of generally horizontal cigarettes in which all of the cigarettes have said given diameter and are arranged side by side with their longitudinal axes parallel to one another, so that when said horizontal layer of cigarettes is present in said space, said columns of cigarettes are supported on respective cigarettes in said layer;

each said generally vertical wall, if disposed between two of said channels, having a thickness transversally of said infeed hopper at said lower end of such generally vertical wall, which is less than said given diameter, so that said cigarettes of said columns, as successively deposited in respective said layers on said surface on said shelf, are initially spaced apart by distances which are each less than said given diameter;

a pushing means juxtaposed with said space and arranged to



simultaneously act, in use, upon opposite laterally outermost ones of said cigarettes in said layer in said space for pushing said laterally outermost cigarettes sideways towards one another thereby diminishing all of said distances by which said cigarettes in said layer in said space are initially spaced apart and correspondingly horizontally condensing said layer in width in said space;

retaining means associated with said shelf and adapted to act, in use, on a single cigarette in said layer to hold a non-laterally outermost cigarette in said layer in said space sufficiently securely against said shelf as said pushing means is being operated in use to condense said layer in width, as to prevent said non-laterally outermost cigarette from being moved sideways as said layer is being condensed in width;

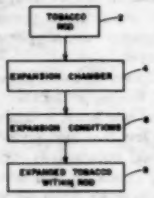
an indexing means juxtaposed with said space and arranged to simultaneously act, in use, upon respective one ends of said cigarettes in said horizontal layer in said space, after operation of said pushing means to condense said layer in width for transferring said layer horizontally in a direction parallel to the longitudinal axes of said cigarettes in said horizontal layer throughout such a distance that said layer is no longer disposed directly under said lower ends of said vertical walls and a successive layer can form on said surface of said shelf by downward movement of said cigarettes in said columns.

4,962,773

PROCESS FOR THE MANUFACTURE TOBACCO RODS CONTAINING EXPANDED TOBACCO MATERIAL

Jackie L. White, Pfafftown; Robert E. Grubbs, Lexington; Hoyt S. Board, Winston-Salem; Mark L. Raker, Clemmons; Thomas A. Perfetti, Winston-Salem, and Richard G. Haberkern, King, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Aug. 13, 1987, Ser. No. 85,439
Int. Cl.[5] A24B 3/18; A24C 5/60
U.S. Cl. 131—291 29 Claims



1. A process for providing a rod suitable for the use in the manufacture of smoking articles, the process comprising:

(i) providing a tobacco rod having a tobacco filler material contained in a circumscribing wrapping

(ii) impregnating the tobacco filler material with a halocarbon or hydrocarbon fluid; and then

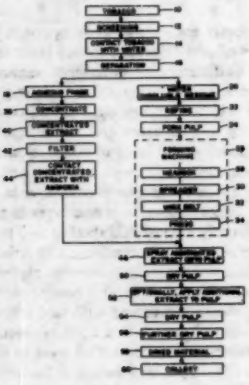
(iii) subjecting the tobacco rod to conditions sufficient to provide volume expansion to at least a portion of the tobacco material.

4,962,774

TOBACCO RECONSTITUTION PROCESS

James S. Thomaszou, Statesville; Elwood L. Williams, Jr., Lewisville; Barry L. Bryant, Clemmons; Cynthia H. Curtis, Kernersville, and Thomas W. Brown, Winston-Salem, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Nov. 16, 1988, Ser. No. 272,156
Int. Cl.[5] A24B 3/14
U.S. Cl. 131—309 10 Claims



1. A process for providing a reconstituted tobacco material, the process comprising the steps of:

(a) extracting components from tobacco material using a liquid solvent having an aqueous character thereby providing (i) a liquid solvent having extracted tobacco components therein, and (ii) a tobacco portion insoluble in the solvent; and then

(b) separating at least a portion of the liquid solvent and extracted tobacco components therein from the insoluble tobacco portion; and then

(c) forming the insoluble tobacco portion into a predetermined shape; and

(d) contacting the liquid solvent and extracted tobacco components with an effective amount of ammonia so as to ammoniate the extracted tobacco components; and then

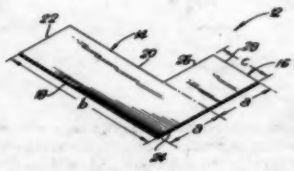
(e) contacting the insoluble tobacco portion of step (c) with ammoniated liquid solvent and extracted tobacco components of step (d).

4,962,775

CUSHION WRAP PAPER FOR PERMANENT WAVE HAIRSTYLING AND DISPENSER

Joseph Squatrito, 116 Corbin Ave., Staten Island, N.Y. 10308

Filed Jan. 21, 1988, Ser. No. 146,308
Int. Cl.[5] A45D 8/00
U.S. Cl. 132—222 3 Claims



1. A plurality of stacked elongated rectangular sheets of cushion wrap paper, each sheet having opposed first and second parallel long side edges and opposed parallel end edges, each said sheet having a longitudinally extending cut line extending entirely through said sheet and disposed substantially midway between said side edges, said longitudinal cut line having opposed ends spaced inwardly from the respective end edges of said sheet by substantially equal distances, each said sheet further comprising first and second transverse cut lines extending respectively from the opposed ends of the longitudinal cut line to the respective first and second side edges, whereby said cut lines define first and second stacks of nested, generally L-shaped cushion wrap papers in said plurality of stacked rectangular sheets such that the stacked sheets may be stored in a dispenser carton having opposed removable ends for providing ready access to the end edges of the individual sheets of L-shaped cushion wrap paper disposed therein.

4,962,776

PROCESS FOR SURFACE AND FLUID CLEANING

Benjamin Y. H. Liu, North Oaks, and Kang H. Ahn, Minneapolis, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Division of Ser. No. 30,895, Mar. 26, 1987, Pat. No. 4,817,652.
This application May 3, 1988, Ser. No. 189,627
Int. Cl.[5] B08B 5/00
U.S. Cl. 134—11 32 Claims

1. A method for cleaning a surface of a precision manufactured component, comprising the steps of:

(a) exposing the surface to a cleaning fluid in the vaporous state;

(b) forming a film of liquid cleaning fluid on the surface;

(c) freezing said film to entrap microparticles present on the surface, said microparticles having a minimum particle size of at least as small as 0.05 microns; and

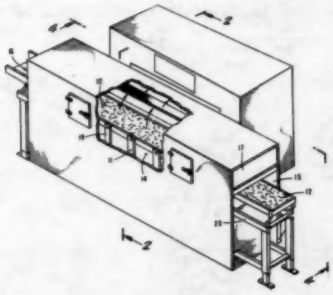
(d) removing the frozen film and said entrapped microparticles from the surface.

4,962,777

SYSTEMS FOR CLEANING AND COOLING PRODUCE

Laurence D. Bell, Carmel Valley, Calif., assignor to Transfresh Corporation, Salinas, Calif.

Filed May 21, 1985, Ser. No. 736,645
Int. Cl.[5] B08B 3/02
U.S. Cl. 134—63 24 Claims



23. An apparatus for cooling a layer of subdivided, unblanched, unboiled produce comprising means for conveying said layer along a linear path and means for directing a flow of cool air, under pressure, through said conveying means and then through said layer, and at a temperature below the temperature of the subdivided produce before cooling begins, but above the freezing point of water, for cooling said layer as said layer moves along said linear path.

4,962,778

BACKWASHING DISPENSER FOR AIR CONDITIONER DRAIN PANS

Brent J. Driskill, 1900 Bonnie, Metairie, La. 70001

Filed Mar. 7, 1989, Ser. No. 320,275
Int. Cl.[5] B08B 3/02
U.S. Cl. 134—169 C 10 Claims

1. An air conditioner drain line and drain pan cleaner kit apparatus comprising:

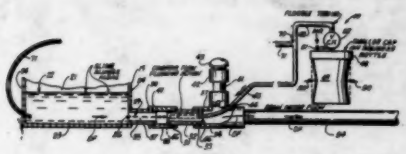
(a) a drain outlet structure for draining accumulated fluid from the pan of an air conditioner and including a drain flow line with a drain line bore for transmitting such fluid to a desired remote discharge point;

(b) the drain outlet structure including a fitting body positioned during use in the drain flow line and adjacent the air conditioner drain pan, the fitting having a fitting bore communicating with the drain line bore;

(c) fitting port extending both externally and internally of the fitting body, communicating with the flow bore;

(d) a flexible flush line conduit comprising an elongated tubular member with a tube lumen for conveying flow, and connected during use to the fitting port extending therethrough, the tubular member having an external diameter equal to or smaller than the internal diameter of the drain line bore and equal to or larger than the fitting port;

(e) the flush line conduit forming a slideable connection with the fitting port and a seal therewith so that excessive fluid



will not leak from the fitting port during use, and the flush line defines an acute angle with the drain line bore axis at the fitting outlet;

(f) the flush line being extendable between the fitting and a position at least adjacent the drain outlet so that the flush line or fluid dispensed therefrom can mechanically break up solid material clogging the drain outlet structure;

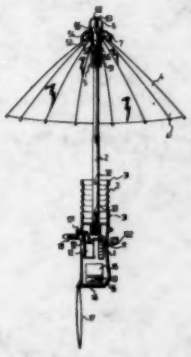
(g) pump means containing fluid for pumping a cleaning fluid into the flush line lumen and drain line bore.

4,962,779

MULTI-FUNCTION UMBRELLA

Yeong-Ming Meng, 4-1 Fl., No. 171, Loh Yeh St., Taipei, Taiwan

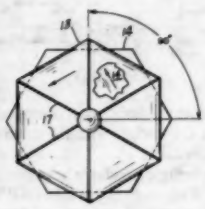
Filed Dec. 6, 1989, Ser. No. 447,013
Int. Cl.[5] A45B 3/00
U.S. Cl. 135—16 2 Claims



1. A multi-function umbrella comprising generally a multi-section rod, a handle portion provided on a lower end of said rod and a canopy body provided on a top end of said rod; a head which is generally a cylindrical tube being threadedly engaged on said top end of said rod; a spring; a first battery and a first bulb being provided in said head; and a lid with a first switch being threadedly engaged on a top end of said head, said first switch controlling an electrical circuit of said first bulb, at least on opening being formed in said lid so that light emitted from said first bulb is visible through said opening; a cap with an inner thread being threadedly engaged on said top end of said head; a lower end of a flexible sleeve being fixed on a top portion of said handle portion, a mounting ring with an outer thread being provided on top of said sleeve; and said

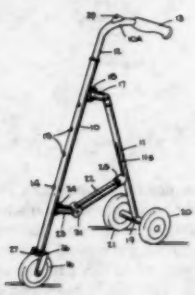
mounting ring of said sleeve being threadedly engageable with said cap when said canopy body is folded.

4,962,780
VARIABLE SUNSHIELD
Lawrence W. Engdahl, Guilford, and Howard E. Stein, Bridgeport, both of Conn., assignors to Stenmiak, Incorporated, Hamden, Conn.
Filed Feb. 6, 1989, Ser. No. 306,569
Int. Cl.[5] A01G *13/02*
U.S. Cl. 135—20 R 22 Claims



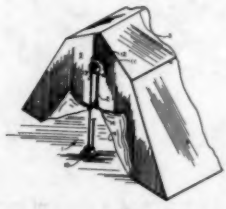
1. A sun shield device comprising:
a shaft means,
a first screen means extending about said shaft means,
a second screen means extending about said shaft means overlapping said first screen means,
each screen means having a plurality of areas of different opacity, each area being operable to transmit a different degree of solar radiation,
at least one screen means being rotatable about said shaft means relative to the other screen means whereby the relative position of the first and second screen means varies the transmission of solar radiation through said sun shield device.

4,962,781
COLLAPSIBLE ROLLING CANE
Maurice S. Kanbar, 4 E. 77th St., New York, N.Y. 10021
Filed Dec. 26, 1989, Ser. No. 456,517
Int. Cl.[5] A45B *1/00*
U.S. Cl. 135—65 6 Claims



1. A collapsible rolling cane adapted to assist an elderly or other person who has difficulty in walking, said cane comprising:
(a) a front leg having a front wheel mounted at its lower end, a handle attached to its upper end, a first hinge joined to the front leg at a position below its upper end, said first hinge having a pivoted leaf, and a second hinge joined to the front leg at a position above its lower end, said second hinge having a pivoted leaf;
(b) a shorter tubular rear leg having a slide therein and whose upper end is pivotally coupled to the leaf of the first hinge;
(c) a transverse axle having a rear wheel mounted on either end thereof to provide a pair of spaced apart rear wheels, the lower end of the rear leg being joined to said axle at its midpoint; and
(d) an arm bridging the front and rear legs, one end of the arm being pivotally coupled to the leaf of said second hinge, the other end of the arm being pivotally connected through a longitudinal slot in the tubular rear leg to said slide therein, whereby when the cane is collapsed to put it in an inactive state, the slide rides up the rear leg to fold the arm and position the front and rear legs in parallel relation and to position the front wheel intermediate the spaced apart rear wheels; and when the cane is put in an active state, the slide rides down the rear leg to extend the arm and cause the front and rear legs to assume an acute angle and the front and rear wheels then engage the ground at the points of a triangle to render the rolling cane stable.

4,962,782
APPARATUS FOR OPENING AND CLOSING TENT ZIPPERS
Joseph C. Landrum, 10127 Pawnee Rd., West Salem, Ohio 44287
Filed Oct. 6, 1989, Ser. No. 418,194
Int. Cl.[5] E04H *15/64*
U.S. Cl. 135—119 19 Claims

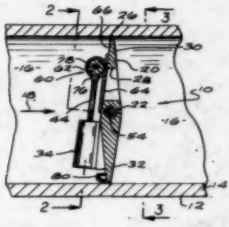


1. An apparatus for moving a sliding member of a generally linearly vertically extending zipper attached to a wall of a tent, between an upper end and a lower end of the zipper for opening and closing an access opening formed in the tent all, said apparatus including:
(a) a first pulley mounted on a stake and adapted to be driven into the ground and positioned adjacent to and aligned with the lower end of the zipper;
(b) a second pulley adapted to be positioned adjacent to and aligned with the upper end of the zipper; and
(c) cord means extending between the pulleys and adapted to be attached to the sliding member of the zipper, for moving the sliding member between the upper and lower ends of the zipper for opening and closing the access opening of the tent, upon movement of the cord means.

4,962,783
BUTTERFLY VALVE APPARATUS AND METHOD
Larry K. Ball, Chandler, and Marshall U. Hines, Scottsdale, both of Ariz., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Oct. 16, 1989, Ser. No. 422,380
Int. Cl.[5] F16K *1/22*
U.S. Cl. 137—1 19 Claims

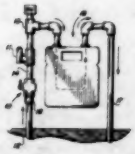
17. The method of stopping and throttlingly controlling a flow of pressurized fluid, said method comprising the steps of:

conveying said fluid flow through a duct;
disposing a plate-like butterfly valve member in said duct for free pivotal movement about a transverse axis substantially bisecting said duct between a first position transverse to and closing said duct and a second position non-transverse or substantially parallel with said duct to open said fluid flow therein;



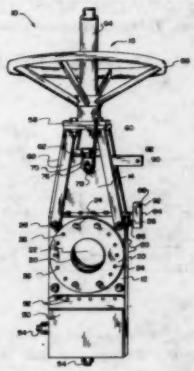
providing an aperture through said butterfly valve member in one of a pair of wings thereof which are on opposite sides of said pivot axis and substantially of equal area;
opening and closing said aperture with a pilot valve member carried upon said butterfly valve member;
using an actuator including a motor to move said pilot valve to open and close said aperture, and
carrying said actuator and motor upon said butterfly valve member.

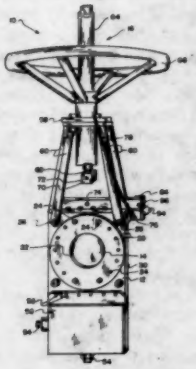
4,962,784
TOP BREAK VALVE DEVICE AND SYSTEM
Kirk C. Collins, 102 SW Ave. E, Seminole, Tex. 79360
Filed Feb. 6, 1990, Ser. No. 475,539
Int. Cl.[5] F16K *43/00*
U.S. Cl. 137—15 **15 Claims**



11. In a gas flow measuring system wherein a gas meter is positioned above the ground and is connected to a supply line by a gas piping system that includes a valve device, the valve device having a valve element therein which controls flow to the gas meter, the method of selecting the downstream side of said valve device for a break that may occur in the gas piping system in response to the gas flow measuring system being impacted by a moving object comprising the steps of:
providing a passageway through said valve device through which gas can flow;
providing threads at opposed marginal ends of said passageway, providing a cylindrical surface at one opposed end with the threads being located intermediate said valve element and the cylindrical surface;
threading said inlet end for only a portion of its length intermediate said cylindrical surface and said valve element;
providing the wall section at the cylindrical surface an inside diameter slightly greater than the outside diameter of the supply line;
whereby said valve, when connected in a riser, and impacted by a moving vehicle, will preferentially break at the outlet threads while the inlet threads remain intact so that the valve element can be moved to the closed position to thereby enable the flow of gas to be shut off from the broken system, and permitting removal of the broken riser and inserting a new riser to enable the valve to be re-opened to resume gas flow to the gas meter.

4,962,785
SAFETY VALVES
Walter A. Clifford, 906 Golf View, Tampa, Fla. 33629
Continuation-in-part of Ser. No. 322,669, Mar. 13, 1989. This application Jan. 8, 1990, Ser. No. 462,021
Int. Cl.[5] F16K *35/06, 3/02*
U.S. Cl. 137—383 **6 Claims**





2. A gate valve comprising:
housing walls secured together in face to face relationship with an aperture extending through each housing wall in alignment about a central axis and defining a chamber therebetween;
a gate plate reciprocable along an axis between an open position wherein the gate plate is oriented for allowing the

flow of fluid through the apertures and the chamber and a closed position wherein the gate plate is oriented for precluding the flow of fluid through the apertures;

annular sleeves fabricated of an elastomeric material and having sealing projections positioned in operative association with the apertures and extending into the chamber in sealing contact with the gate plate when in the closed position; and

locking means extending from the gate plate and housing walls, laterally of said axis for securing the gate plate against movement with respect to the housing walls when in the gate plate is in the closed position.

4,962,786

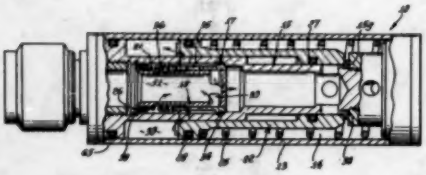
HYDRAULIC FUSE WITH PRESSURE REGULATOR

Walter G. Gellerson, Yakima, assignor to Dowty Decoto, Inc., Yakima, Wash.

Filed Oct. 23, 1989, Ser. No. 424,943

Int. Cl.[5] F16K *21/16*

U.S. Cl. 137—493.6 **9 Claims**



1. In an improved hydraulic fuse to monitor the quantity of hydraulic fluid passing through the fuse, and then block such flow when a selected quantity of fluid has passed through the fuse, the combination comprising:

(a) a body structure containing cavity structure,

(b) a primary piston in the cavity structure and movable endwise to control fluid flow through a first port,

(c) a sleeve, and a slider in the cavity structure, and in the path of fluid flow toward the primary piston,

(d) the sleeve and slider being coaxially relatively axially movable, and there being a regulator spring acting to urge the sleeve in one axial direction,

(e) and fluid flow control slots formed by the sleeve and slider to control flow both to said piston for controllably displacing same, and to said first port, and characterized in that:

(i) as the forward flow rate through the fuse reaches a threshold, the piston begins its said movement toward said first port, and

(ii) as the flow rate increases above said threshold, relative axial movement between the sleeve and slider acts:

to maintain nearly constant the fluid pressure drop across primary slot means included within said control slots; and

to controllably meter fluid flow to the piston via metering slot means included within said control slots, for displacing said primary piston as aforesaid,

(f) whereby the piston is displaced to close the first port after a required quantity of fluid has passed through the fuse,

(g) the slider being hollow to pass flow via said primary slot means from the slider interior to the slider exterior, and via said primary slot means toward said first port.

4,962,787

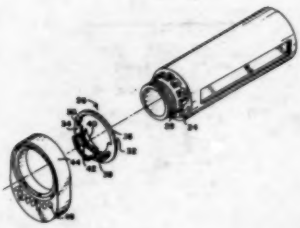
FLUID FLOW REVERSING AND REGULATING RING

Phillip A. Mayhew, Sayre, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Mar. 17, 1989, Ser. No. 325,656

Int. Cl.[5] F01C *13/02*

U.S. Cl. 137—856.3 **21 Claims**



1. A flow reversing assembly for control of exhaust fluid flow for a fluid mechanism comprising in combination:

a mechanism housing having circumferentially adjacent and axially extending primary and secondary fluid passageways;

a control ring member having two opposed faces comprising:

a first face having a thru slot in fluid communication with said primary passageway and a circumferentially adjacent blocking flange; and

a second face having a turning flange to direct exhaust flow to said secondary fluid passageway such that said turning flange is the reverse of said blocking flange.

4,962,788

ARRANGEMENT FOR TREATING HAIR WITH LIQUID IN CIRCULATING PROCESS

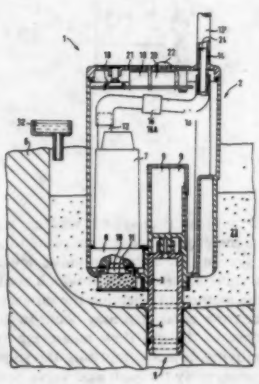
Bodo Hildebrandt, Riedstadt, Fed. Rep. of Germany, assignor to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Filed Mar. 14, 1988, Ser. No. 167,831

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3708009

Int. Cl.[5] F16K *57/00*

U.S. Cl. 137—557 **14 Claims**



1. An arrangement for treating hair with a treatment liquid in a circulating process, comprising

a circulating pump for circulating said treatment liquid;

an electric motor arranged to drive said circulating pump;

means for starting said electric motor connected to said electric motor including at least one treatment start switch;

means for determining a treatment end including sensing means arranged to sense a parameter of said treatment liquid, said means for determining said treatment end being structured to determine when said parameter of said treatment liquid becomes a constant, said treatment end occurring when said parameter becomes constant;

means for shutting off said motor connected with said means for determining said treatment end, said means for determining said treatment end and said means for shutting off said motor being structured so that said electric motor is turned off at said treatment end when said parameter is determined to be constant; and

means for optimizing a measuring accuracy of said parameter.

4,962,789

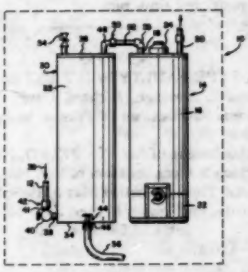
EMERGENCY WATER RESERVOIR

Kenneth Benscoter, 9254½ Walnut St., Bellflower, Calif. 90706

Filed Nov. 13, 1989, Ser. No. 435,699

Int. Cl.[5] E03B *11/02*

U.S. Cl. 137—571 **14 Claims**



1. An emergency water reservoir comprising a hollow enclosed tank constructed entirely of non-toxic materials having a water inlet coupled to receive water directly from a hot water heater plumbing termination of a water supply system for a building, a water outlet coupled directly to a hot water heater inlet, and a water tap for withdrawing water for use directly from said tank.

4,962,790

FAUCET HAVING PROXIMITY ACTUATION CONTROL AND HAND CONTROL THAT CAN BE INTERCHANGEABLE

Ching-Liang Chou, 49, Alley 37, Chung Hsing Road, and Kai-lin Hsieh, 157, Nan Lei Road, both of Ho Mei Town, Changhua County, Taiwan

Filed Aug. 9, 1989, Ser. No. 391,297

Int. Cl.[5] F16K *31/02, 11/056*

U.S. Cl. 137—599 **3 Claims**

1. a faucet that has interchangeable proximity actuation control and hand control for hot/cold water comprising:

a proximity actuation assembly attaching to a main assembly, being placed and covered by a faucet shell assembly;

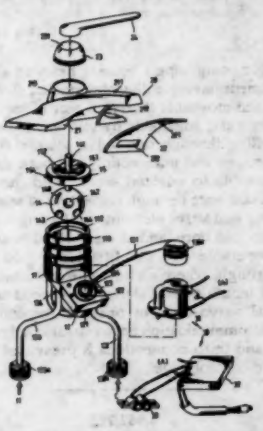
said main assembly having a valve seat body, a solenoid holder, a water conduit assembly, a ball valve and a valve stem guide thereof;

said valve seat body having, a hemispherical valve seat on its inner bottom surface, thereon a hot water and a cold water inlet hole being, respectively opposed, located at the same planes as taken from top view, a front water and a rear water outlet hole, extending respectively from the middle of the plane at the opposite directions, being respectively located on said hemispherical valve seat, from thereon extending upwardly, a holding protrusion, being formed on the inner surfce of said valve seat body,

said solenoid valve holder, being provided for attaching said proximity actuation assembly to said solenoid valve holder;

said water conduit assembly, comprising: a hot water inlet pipe and a cold water inlet pipe, being respectively connected with a said hot water inlet hole and said cold water inlet hole, a bi-direction feed pipe having, a pipe juncture being, formed on its concave spherical surface therewith connecting an outlet pipe at its lower end thereon extending outwardly and upwardly being formed a faucet head, provided for permitting the occurring of power failure the water pressure forcing the water passing therethrough, connecting said valve outlet hole with one end, said rear water outlet channel with the other end;

said ball valve being corresponding to the inner surface of said hemispherical valve seat and having, a valve stem, extending upwardly and outwardly from its upper periphery, a holding groove, extending axially from said valve stem, a front water outlet hole and a rear water outlet hole, being colinear and respective to each other; respective below to the either side of said front water outlet hole, being formed a front hot water inlet hole and a front cold



water inlet hole, said front water outlet hole, and said fron cold inlet hole being, respective to said front water outlet channel, hot water inlet hole and cold water inlet hole, provided for defining said proximity actuation controlling the water out from said faucet head; said rear water outlet hole, said rear hot water inlet hole and said rear cold water inlet hole being, respective to said rear water outlet channel, said hot water inlet hole and said cold water inlet hole, provided for defining said hand controlling the water out from said faucet head;

said valve stem guide having, an H-shaped guide groove being formed on its upper surface, a locking protrusion being formed on its periphery;

said faucet assembly comprising a main faucet shell, a faucet throat cover and a handle thereof; said main faucet shell, including a faucet neck, extending outwardly and somewhat upwardly from thereon, the extending of said faucet neck thereunder, shaping a faucet throat, extending concavely and downwardly to the lowe edge of said main faucet shell, a faucet throat cover being, provided for covering the assembly of said main assembly and said proximity actuation assembly inside said main faucet shell, a handle being elongated in shape and having a rear circular portion thereon a snap-fitting hole being formed for connecting with said valve stem; thereby said front water

outlet channel, hot water inlet hole and cold water inlet hole being respective to said front water outlet channel, hot water inlet hole and cold water inlet hole, or said rear water outlet hole, hot water inlet hole and cold water inlet hole being respective to said rear water outlet channel, hot water inlet hole and cold water inlet hole, will be adjustable by pulling said handle to rotate said valve.

4,962,791

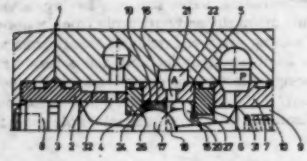
SEAT VALVE

Horst Rott, Mühlbach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Postfache, Fed. Rep. of Germany

Continuation of Ser. No. 254,879, Oct. 4, 1988, abandoned. This application Nov. 13, 1989, Ser. No. 436,929

Int. Cl.[5] F15B *13/042*

U.S. Cl. 137—625.66 **9 Claims**



1. Seat valve comprising a housing defining a bore, a spherical valve element having a diameter smaller than the diameter of said bore and moveable therein, a pair of valve seats spaced along said bore and engagable by said valve element for controlling the flow through said valve seats, a first connection extending through and intersecting said bore and being selectively connectable to selected second and third connections remote from said bore through respective of said valve seats, a sleeve holding said valve element and having a diameter complementary to said bore, and at least one defining sleeve control edge cooperable with said first connection to control the flow therethrough, wherein said valve seats, said first connection, and the length of said sleeve are spaced such that when said spherical valve element opens a respective valve seat simultaneous communication between said first connection and said second and third connections is prevented by movement of said sleeve control edge.

4,962,792

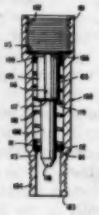
FLUIDS RATE OF FLOW SAVING OR LIMITING DEVICE

Cesar F. Chaul, Av. Revolución No. 1579, San Angel 01000, Mexico

Filed Jun. 2, 1989, Ser. No. 360,815

Int. Cl.[5] G05D *7/01*

U.S. Cl. 138—42 **4 Claims**



1. In a fluids rate of flow saving or limiting device comprising a tubular fitting having an inlet end and an outlet end, said inlet end having a larger diameter than said tubular fitting and said outlet end having a smaller diameter than said tubular fitting to form a first shoulder between said inlet end and said tubular fitting and a second shoulder between said tubular fitting and said outlet end, a needle type shutter comprising an upper cylindrical body having a radially outwardly extending flange on the top thereof and a lower cylindrical body having a needle shaped end at the bottom thereof, said lower cylindrical body being of a diameter smaller than said upper cylindrical body to form a third shoulder therebetween, and a spring having its upper end bearing against said flange of the shutter and its lower end bearing on a washer assembly supported by said second shoulder, the improvement which comprises at least one surface groove longitudinally provided on the surface of said upper cylindrical body of the shutter and extending the full length thereof to provide a free non-clogging passage for the fluid from said inlet end through said shutter to said outlet end of the fitting, said washer assembly supported on said second shoulder comprising a soft washer sandwiched between a pair of rigid washers, said soft washer projecting radially inwardly of said rigid washers to a distance sufficient to dampen a rattling action of said shutter against the inner walls of said fitting, and a plurality of projections on said third shoulder adapted to about against the corresponding one of said rigid washers when the shutter is pushed by high pressure fluid downwardly through the washer assembly, so as to provide a corresponding plurality of slots between each pair of said projections for allowing the passage of said fluid therethrough at a restricted flow rate.

4,962,793

PIN TYPE FAULTY WEFT EXTRACTOR

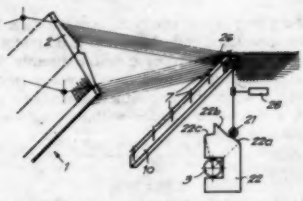
Jean-Luc Dussart, Sissonne; Richard David, Wasquehal, and Bruno Grange, Satillieu, all of France, assignors to Picanol N.V., Belgium

Continuation-in-part of Ser. No. 273,477, Nov. 21, 1988, abandoned, which is a continuation of Ser. No. 29,759, Feb. 13, 1987, abandoned. This application May 5, 1989, Ser. No. 347,864

Claims priority, application France, Jun. 14, 1985, 85 09098

Int. Cl.[5] D03D *47/30*

U.S. Cl. 139—116.2 **23 Claims**



18. An apparatus for freeing up a mispicked weft thread in a shuttleless loom which includes a loom shed and beat-up means including a beat-up element mounted on a beat-up shaft for reciprocating movement in synchronism with loom operation to beat-up successively inserted wefts into a cloth fell line, a beat-up motion occurring as pivotal movement of the beat-up element about a beat-up shaft access, comprising:

means for detecting a defective pick and retracting the beat-up means in response thereto;

at least one weft freeing needle element mounted on the loom by support means disposed adjacent the cloth fell line;

first actuator means for actuating said at least one needle element for movement into and out of the cloth fell line in a direction generally transverse to the warp plane of the loom at the fell line;

second actuator means for actuating said at least one needle element for movement toward and away from the beat-up element in its retracted position while said at least one

needle element is disposed generally in the warp plane of the loom at the fell line; and

means for controlling both of said actuator means in order to move said at least one needle element into the fell line only in response to detection of a just inserted defective pick before beat-up of the just inserted defective pick to engage and free the just inserted defective pick by disengaging it from the fell and moving it back toward the beat-up element after the latter is retracted from its beat-up position.

4,962,794

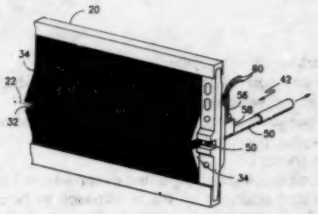
AIR JET LOOM WITH INTEGRAL STRETCH PIPE AND PICK SENSOR

James M. White, Toccoa, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 263,807, Oct. 28, 1988, abandoned. This application Aug. 21, 1989, Ser. No. 395,980

Int. Cl.[5] D03D *47/30, 51/34*

U.S. Cl. 139—370.2 **2 Claims**



1. An air jet weaving machine comprising: a warp beam rotably mounted in one end of said machine, a fabric take-up roll rotably mounted at the other end of said machine and a reed mounted between said warp beam and said take-up roll having a transverse tunnel therein for passage of fill yarn from one side of said machine to the other side thereof, a first air nozzle mounted on one side of said machine adjacent the tunnel in said reed to transmit yarn from one side of said machine through said tunnel to the other side of said machine and a combination stretch pipe and yarn sensor mounted on the warp beam side of said reed adjacent said tunnel at the end thereof to apply tension to the fill yarn in said tunnel and sense the absence of a fill yarn in said tunnel, said stretch pipe projecting through the end of said reed in communication with the takeup roll side of said reed, a second air nozzle mounted on the take up-roll side of the reed facing the reed and said combination stretch pipe and yarn sensor to blow fill yarn into said stretch pipe at a predetermined time and a suction means mounted adjacent the side of said reed opposite to said first air nozzle to apply tension to the projected fill yarn after it has been released from said stretch pipe and the reed has been moved to the beat-up position.

4,962,795

SPRING MOUNTING FOR THE WEFT THREAD INLET END OF THE MAIN NOZZLE OF AN AIR JET LOOM

Horst Haeussler, Lindau, and Othmar Oppl, Hergensweiler, both of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft m.b.H., Bodensee, Fed. Rep. of Germany

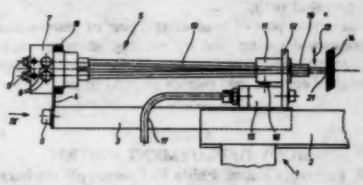
Filed May 2, 1989, Ser. No. 346,892

Claims priority, application Fed. Rep. of Germany, May 4, 1988, 3815088

Int. Cl.[5] D03D *47/30*

U.S. Cl. 139—435.4 **6 Claims**

1. In an air jet loom having a reed (14) with a weft thread air insertion channel (21) and a slay (2), comprising a tiltable nozzle mounting for a main nozzle arrangement (5) including spring elastic means (4a, 4d, 22) for mounting a nozzle inlet end (7) where the weft thread is inserted into said main nozzle arrangement (5) to said slay (2) in such a manner that a nozzle exit end (19) of said main nozzle arrangement (5) is aimed at an entrance of said air insertion channel (21) of said reed (14) defining a weft thread insertion direction, guide means (11, 12, 20) connected to said nozzle exit end (19) for guiding aiming movements of said nozzle exit end along a defined path in any direction in a plane extending perpendicularly to said weft



thread insertion direction as permitted by said spring elastic mounting means, and drive means (15, 16) connected to a guide member (11) of said guide means for moving said nozzle exit end along said defined path in an aiming adjustment.

4,962,796

WEFT BRAKE WITH DAMPING CONTROL

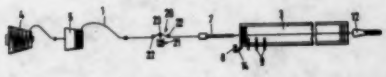
Peter Grimm, Ruti, and Willam Manfred, Galgenen, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 25, 1989, Ser. No. 398,771

Claims priority, application Switzerland, Aug. 25, 1988, 03169/88

Int. Cl.[5] D03D *47/34*

U.S. Cl. 139—450 **11 Claims**



1. A method of picking a weft yarn in a loom comprising the steps of

picking a weft yarn through a predetermined path across a shed of warp yarns;

deflecting the weft yarn during the end of said picking step to brake the yarn; and thereafter reducing the deflection of the yarn part to avoid excessive stress peaks in the yarn during braking.

4,962,797

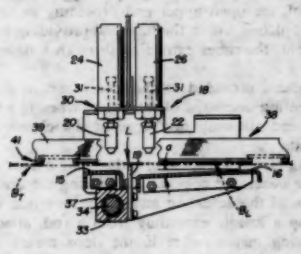
CROSS-CUTTING METHOD FOR BAG FILLING MACHINES

Peter N. Thomsen, 138 Baumont Ave., San Francisco, Calif. 94118

Division of Ser. No. 280,710, Dec. 6, 1988, Pat. No. 4,892,124. This application Aug. 11, 1989, Ser. No. 392,433

Int. Cl.[5] B65B *3/00, 31/00*

U.S. Cl. 141—010 **7 Claims**



1. A method for separating a pair of plastic bags apart from each other along a severable and transversely disposed parting line therebetween comprising the steps of

intermittently moving said pair of bags along a path disposed in a horizontal plane,

stopping movement of said pair of bags along said path to place said severable parting line over an opening defined between a pair of platens and extending transversely relative to said path,

clamping said pair of bags to said pair of platens, and

severing said paring line by moving severing means in a horizontal direction, transversely through said opening, to separate each of said pair of bags from each other.

4,962,798

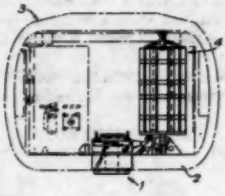
BUOY DEPLOYMENT SYSTEM

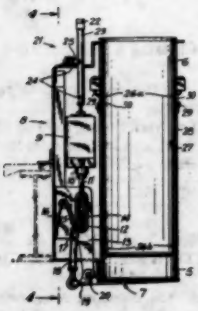
John R. Ferraro, Clinton; Philip P. Foerster, Waterbury; Peter T. Greenstreet, Sandy Hook, all of Conn.; Steven R. Schwarz, Cranbury, N.J., and Milton R. Turgeon, Enfield, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 28, 1988, Ser. No. 250,783

Int. Cl.[5] B64D *1/10, 1/12*

U.S. Cl. 244—137.1 **14 Claims**





1. A gravity launcher for discharging at least one object from an aircraft, the launcher comprising:

a plurality of tubes, each tube sized to accept the object therein, each tube having open upper and lower ends thereof, the open upper end providing an access to the object placed within the tube and providing for reloading in flight, the tubes extending through a floor of the aircraft;

door means, provided at the lower end of the tube, for preventing discharge of the object when in a closed position, and allowing discharge of the object in an open position;

actuating means for opening and closing a door means; and,

override means for opening and closing the door means on failure of the actuating means, the override means comprising a handle extending from a rod, attached to the actuating means, wherein the door means is manually actuatable by displacement of the handle and rod, the rod including recesses mateable with a lock arm, for locking the rod at various positions.

4,962,799

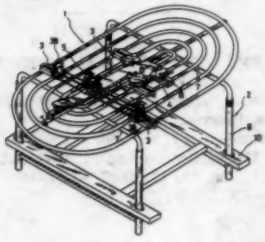
WORKBENCH WITH ITS DEVICES

Chen Ming-Tang, 23-4, Alley 21, Lane 205, Yong Xing Rd. Dali, Taizhong, Taiwan

Filed Feb. 3, 1989, Ser. No. 305,976

Int. Cl.[5] B25H *1/00*

U.S. Cl. 144—286 A **3 Claims**



1. A workbench comprising:

at least one pair of legs, constituting a foldable stand to support the workbench horizontally;

at least one slow-going adjusting clamp adapted to be fixed in varying positions on the workbench to clamp work pieces thereto;

at least one quick-going adjusting clamp adapted to be fixed in varying positions on the workbench to be associated with the at least one slow-going adjusting clamp to clamp workpieces;

at least two bars, each having at least one o-ring shape of the same shape forming a working surface of the workbench, said bars being horizontally spaced apart from one another; and

means for fixing the at least one slow-going adjusting clamp and the at least one quick-going adjusting clamp in position between any two of the bars to treat and clamp workpieces of any shape and size.

4,962,800

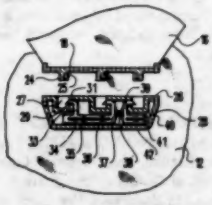
DESIGNER HANDBAG

Adoklye S. Owiriwo, Box 26545, Raleigh, N.C. 27611

Filed Sep. 5, 1989, Ser. No. 402,465

Int. Cl.[5] A45C *3/06, 13/08, 13/10*

U.S. Cl. 150—118 **2 Claims**



1. A designer handbag, comprising:

a flexible pouch having a top opening communicating with a hollow interior;

front and back surfaces of said pouch formed from a fur pelt material;

a flap formed by a top portion of said back surface dimensioned to close said open top;

opposite side surfaces and a bottom surface of said pouch formed from a leather material;

a metallic ribbing extending across said front and back sur-

faces at an intersection of said fur pelt and leather materials;

a metallic bar extending across a free edge of said flap;

a plurality of rectangular catch members extending from said bar in spaced parallel relation;

a generally triangular recess formed in a side face of each of said catch members;

a latch body extending laterally at a central zone on said front surface, generally parallel with said bar;

a plurality of spaced rectangular wells formed in a top edge of said latch body, said wells each having a top opening, closed side and bottom walls, and said top openings of said wells dimensioned to receive said catch members;

a latch cam slidably received through a lateral aperture in a sidewall of each of said wells, each of said latch cams having an inclined outer surface dimensioned for engagement in one of said triangular recesses;

a first group of at least one of said latch cams mounted on a first slide block received for reciprocal sliding movement within said latch body;

a second group of at least two of said latch cams mounted on a second slide block received for reciprocal sliding movement within said latch body;

each of said first and second slide blocks having an elongated slot receiving a stationary guide pin;

said first and second groups of said latch cams facing in opposite directions;

a coil spring received between said first and second slide blocks and biasing said slide blocks apart;

a plurality of actuating buttons extending through a front face of said latch body, said actuating buttons operatively connected to move said slide blocks together to release said latch cams from engagement with said catch members;

and

an ornamental gem secured to each of said actuating buttons.

4,962,801

PNEUMATIC TIRES HAVING UNIDIRECTIONAL TREAD PATTERN

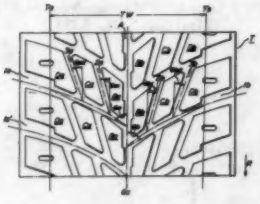
Toru Tsuda, Higashimurayama, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Feb. 9, 1989, Ser. No. 308,083

Claims priority, application Japan, Feb. 9, 1988, 63-26588

Int. Cl.[5] B60C *11/11*

U.S. Cl. 152—209 R **7 Claims**



1. A pneumatic tire comprising; a tread toroidally connected at both ends to a pair of sidewalls, a unidirectional tread pattern having a plurality of main slant grooves obliquely extending from an end of said tread toward a central portion of said tread and arranged at a given space in the circumferential direction of the tire, an island portion defined between two adjoining main slant grooves in the circumferential direction obliquely extending between said adjoining main slant grooves with respect to the equator of the tire and, at least two auxiliary slant grooves including a first auxiliary slant groove located nearest to the equator and an n-th auxiliary slant groove nearest to said end of the tread formed in said island portion so as to satisfy the following relationship:

$$\theta a > \theta an > \theta a(n-1) > \ldots\ldots \theta a2 > \theta a1$$

where θa is an inclination angle of said main slant groove defined by a line segment determined by connecting an intersect between a center line of said main slant groove and the equator of said tire to an intersect between the center line and a tread end with respect to the tire equator at an acute angle, $\theta a1$ is an inclination angle of said first auxiliary slant groove and, θan is an inclination angle of said n-th auxiliary slant groove, where the inclination angles $\theta a1$ and θan are defined by a line segment obtained by connecting intersects of a centerline of an auxiliary slant groove with the center lines of the adjoining two main slant grooves to each other with respect to the equator of the tire at an acute angle, and wherein an inclination direction of an auxiliary slant groove with respect to the equator of the tire is the same as an inclination direction of a main slant groove crossing said auxiliary slant groove, and auxiliary slant grooves extend only from one main slant groove to an adjoining main slant groove.

4,962,802

PNEUMATIC VEHICLE TIRE

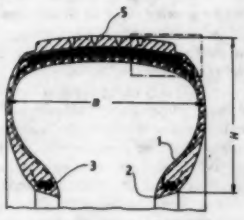
Dieter Rohde, Lehrte, Fed. Rep. of Germany, assignor to Continental Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jan. 27, 1989, Ser. No. 303,509

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 3802503

Int. Cl.[5] B60C *9/00, 1/00*

U.S. Cl. 152—532 **4 Claims**



1. In a pneumatic vehicle tire having a radial carcass, the load-carriers of which are made of a material of high strength comparable to that of steel, and the ends of which are anchored in the tire beads by being looped around pull-resistant bead cores, with said tire having a centrally disposed tread strip that has recessed portions respectively on each tread side, and with said tire also having a multi-ply belt, said belt relative to the tread sides respectively extending into the said recessed portions, and which has load-carriers made of a material of high strength comparable to that of steel, the improvement in combination therewith comprising:

a first rubber layer, of soft, low-damping rubber, that disposed between said radial carcass and the radially innermost one of said plies of said belt and that extends continuously between opposite belt edges as well as to the sides of the tire beyond the belt plies, with said rubber layer having a Shore A hardness of from 50 to 65, and furthermore having a rebound elasticity specifically in a range of between 55 and 70%; and

a second low-damping rubber layer that is disposed between plies of said belt; said first rubber layer, over its entire axial extension, having a thickness of up to 2 mm.

4,962,803

PNEUMATIC TIRE INCLUDING A BARRIER PLY

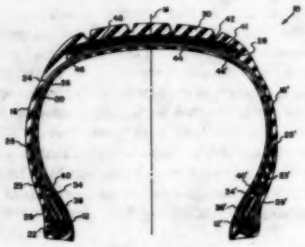
Thomas N. H. Welter, Keispelt, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 20, 1985, Ser. No. 746,620

Claims priority, application European Pat. Off., Aug. 21, 1984, 84630118.2

Int. Cl.[5] B60C 9/13

U.S. Cl. 152—541 5 Claims



1. A pneumatic tire (10) comprising:

(a) a pair of annular beads (12,12') spaced from one another along the axis of the tire;

(b) a liner (20) extending between the tire beads;

(c) a reinforcement ply (24) positioned on the outer side of the liner and including parallel cords made from an aromatic polyamide material or parallel cables made from steel wire, the cords or cables (27) being embedded in an elastomeric material and extending between the beads, the reinforcement ply having a plurality of cord or cable ends per centimeter and having a ply modulus of elasticity, the tire having no other bead-to-bead ply of parallel cords or cables having a greater ply modulus of elasticity, the cords or cables of the reinforcement ply forming an angle β with the mid-circumferential plane (M) of the tire, the angle β being in the range from 80° to 90°;

(d) a barrier ply (26) including parallel cords or cables (21) embedded in an elastomeric material and extending between the beads, the barrier ply wrapping around the respective beads of the tire, thereby, to be anchored at such respective beads, the barrier ply being positioned between the liner and the reinforcement ply to form a barrier between them, the barrier ply having a plurality of cord or cable ends per centimeter and having a ply modulus of elasticity that is less than one-fifth the ply modulus of elasticity of the reinforcement ply, the cords or cables of the barrier ply forming an angle α with the mid-circumferential plane (M) of the tire, the angle α differing from the angle β by an amount less than or equal to 20°;

(e) a circumferentially inextensible belt assembly (28) positioned in the crown region of the tire.

4,962,804

HEAVY DUTY PNEUMATIC TIRE HAVING DEFINED TIRE ENLARGEMENT WITH INFLATION

Hiroshi Ueda; Hisaki Yoshigai, and Mikio Masunaga, all of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

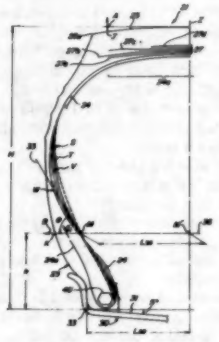
Continuation of Ser. No. 16,909, Feb. 20, 1987, abandoned. This application Dec. 27, 1988, Ser. No. 289,537

Claims priority, application Japan, Feb. 20, 1986, 61-36453

Int. Cl.[5] B60C 3/00

U.S. Cl. 152—454 6 Claims

1. A heavy duty pneumatic radial tire including a pair of bead portions, a carcass consisting of one steel cord layer and extending between said bead portions, and a tread portion arranged radially outward of a crown portion of said carcass, wherein when said tire is mounted on a standard rim for said tire having a bead base at an angle of approximately 5° relative to a rotation axis of said tire with said rim engaging said bead portions of said tire, a tire enlargement ratio A/B lies within A/B=0.35–0.8, where A is an amount of enlargement of a shoulder in radial and outward directions corresponding to a radial and outward displacement of a shoulder position J, J being located on the shoulder portion of said tread at a point 10 mm inward from each lateral side edge of said tread toward an equatorial plane of the tire, during filling of the tire to an inner pressure from 7% to 100% of a determined maximum inner



pressure of the tire, B is an amount of enlargement of each bead portion in axial outward directions corresponding to an axial outward displacement of a bead position K, K being located axially on the bead portion outer surface at a height of 27% of a tire sectional height H from a bead heel, during filling of the tire to an inner pressure from 7% to 100% of the maximum inner pressure of said tire, and a carcass tangential angle θ formed between a line parallel to the rotational axis of the tire and a tangent to a carcass line at a height 27% of the tire sectional height H when said tire is filled with 7% of a normal maximum pressure is within the range of 55°–64°.

4,962,805

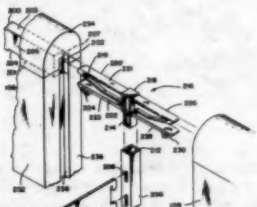
FURNITURE CONNECTOR

John M. Allen, Tacoma, Wash., assignor to Lunstead, Inc., Kent, Wash.

Filed Dec. 11, 1987, Ser. No. 131,934

Int. Cl.[5] A47G 5/00

U.S. Cl. 160—135 23 Claims



1. A clip for assembling generally vertically oriented modular panels of the type used for room dividers wherein each panel includes frame members, at least one of the frame members being a generally horizontal channel having an open end and an aperture in a sidewall thereof positioned inward from the open channel end, the vertical panels being usable with a

support member to which a shelf or other device may be connected for support, the clip comprising:

a body;

a connector member rigidly connected to said body and adapted to coupled with the support member;

a rigid first arm rigidly secured to said body member and extending therefrom, said first arm being adapted to project interior of the frame member of a first panel through the open end thereof;

a second arm secured to said body and extending therefrom in the same general direction as said first arm and spaced therefrom for movement relative to said first arm, said second arm being adapted to project interior of the first panel frame member channel through the open end thereof, said second arm including a projecting lock member adapted to project into the aperture of the first panel frame member channel and prevent removal of said first and second arms from the first panel frame member channel once inserted during normal use of the first panel, said second arm being movable toward said first ram sufficient to permit insertion of said first and second arms into the first panel frame member channel and having sufficient resiliency to bias said projecting lock member into the aperture of the first panel frame member channel when aligned therewith and removably hold said projecting lock member locked within the aperture during normal use of the first panel, said resilient second arm being movable toward said first arm upon selective application of a sufficient actuation release force to remove said projecting lock member from the aperture when it is desired to disconnect the clip from the first panel frame member channel, whereby the clip can be detachably locked to the first panel;

a rigid third arm rigidly secured to said body and extending therefrom, said third arm being adapted to project interior of the frame member channel of a second panel through the open end thereof; and

a fourth arm secured to said body and extending therefrom in the same general direction as said third arm and spaced therefrom for movement relative to said third arm, said fourth arm being adapted to project interior of the second panel frame member channel through the open end thereof, said fourth arm including a projecting lock member adapted to project into the aperture of the second panel frame member channel and prevent removal of said third and fourth arms from the second panel frame member channel once inserted during normal use of the second panel, said fourth arm being movable toward said third arm sufficient to permit insertion of said third and fourth arms into the second panel frame member channel and having sufficient resiliency to bias said projecting lock member into the aperture of the second panel frame member channel when aligned therewith and removably hold said projecting lock member locked within the aperture during normal use of the second panel, said resilient fourth arm being movable toward said third arm to permit upon selective application of a sufficient actuation release force to remove said projecting lock member from the aperture when it is desired to disconnect the clip from the second panel frame member channel, whereby the clip can be detachably locked to the second panel and thus the first and second panels detachably locked together and held in a desired alignment by the clip, said first and third arms being secured to said body at a predetermined angle to lock the first and second panels together at said predetermined angle.

4,962,806

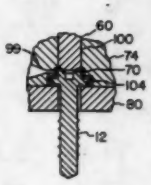
METHOD OF PRODUCING NON-CORROSIVE HEADED COMPOSITE FASTENERS

Donald A. Nottelmann, East Bend; Norman G. Wallace, Statesville, and Joseph E. Stager, Charlotte, all of N.C., assignors to Textro, Inc., Providence, R.I.

Division of Ser. No. 332,718, Apr. 3, 1989. This application Jan. 22, 1990, Ser. No. 468,165

Int. Cl.[5] B22D *19/00*; B29C *47/02*

U.S. Cl. 164—112 **15 Claims**



1. A method for manufacturing a composite fastener comprising the following steps:

a. placing a metal fastener into a metal fastener receiving bore of a shuttle, said shuttle having a flat upper surface, said metal fastener including a shank with an entrant end and an integral insert having a bottom surface, said bottom surface of said insert having a greater outer diameter than the diameter of said shank, and said bottom surface having a lip extending peripherally thereabout, said insert including a configuration for supporting a shuttle pin, so that said metal fastener lip rests upon said shuttle upper surface;

b. placing a mold die including a mold cavity having a shuttle pin contained therein onto said shuttle so that said insert is contained within said mold cavity;

c. supporting the shuttle pin on said metal fastener configuration to align said metal fastener with said shuttle;

d. applying pressure to said shuttle pin to cause said lip to form a seal with said shuttle to prevent molten extrudable material from running down said shank; and

e. extruding molten material into said cavity thereby encapsulating said insert and causing said shuttle pin to withdraw slightly into said mold cavity.

4,962,807

CONTINUOUS OF SEMI-CONTINUOUS CASTING APPARATUS FOR CASTING METALLIC MATERIALS

Harald N ss, Sunndalsora, and Jan Sivertsen, Gros, both of Norway, assignors to Norsk Hydro a.s., Oslo, Norway

Filed Apr. 17, 1989, Ser. No. 338,938

Claims priority, application Norway, Apr. 15, 1988, 881633

Int. Cl.[5] B22D *11/124, 11/07*

U.S. Cl. 164—444 **19 Claims**

1. A continuous or semi-continuous casting apparatus of the direct chill type for casting metallic materials, particularly metal ingots, said apparatus comprising:

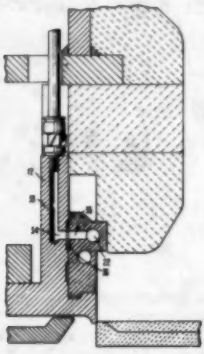
a mold defining a mold cavity with an open inlet for the introduction of molten metal, an open outlet for withdrawal of solidified metal, and coolant supply means for supplying coolant adjacent said outlet for cooling metal;

a ring, formed of a material that is permeable to at least one of oil and gas, mounted in said mold at a position spaced from said inlet, said ring having a plurality of surfaces including at least one first surface facing and defining a portion of said mold cavity;

at least one annular bore formed in said ring and extending through said ring throughout the entire annular dimension thereof;

at least one hole extending through said ring from the exterior thereof and opening into said annular bore, such that

at least one of oil and gas may be supplied from the exterior of said mold to said hole and then to said annular bore, whereby such at least one of oil and gas passes through said material of said ring and enters said mold cavity through said at least one first surface of said ring to form a layer between the metal within said mold cavity and the



wall of said mold to prevent the metal from contacting said wall before the metal solidifies; and

all of said surfaces of said ring other than said at least one first surface thereof being covered with a sealing agent prevention the escape therethrough of the at least one of oil and gas.

4,962,808

METHOD OF PRODUCING A STEEL STRIP HAVING A THICKNESS OF LESS THAN 10 MM

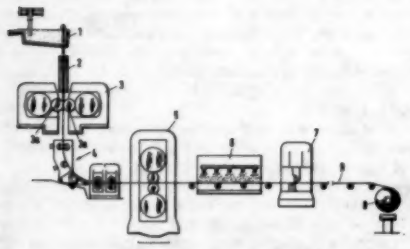
Erich Höffken, Dinslaken, Fed. Rep. of Germany, assignor to Thyssen Stahl Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Jul. 6, 1989, Ser. No. 376,341

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1988, 3823861; European Pat. Off., May 8, 1989, 89108232.3

Int. Cl.[5] B22D *11/00*

U.S. Cl. 164—476 **7 Claims**



1. In the production of a steel strip having a thickness of less than 10 mm by the casting of a steel strand in a cooled continuous ingot mould, wherein a not-yet-completely solidified steel strand is withdrawn from the ingot mould and compressed up to the welding of the inner walls of the already solidified strand shell, the improvement which comprises reducing the thickness of the solidified strand shells in said compression step with a degree of deformation of >40%.

4,962,809

HEAT EXCHANGER

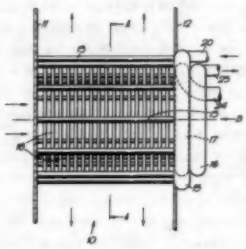
Bryan L. Belcher, Leamington SPA, England, assignor to Rolls-Royce plc, London, England

Filed Mar. 15, 1990, Ser. No. 493,727

Claims priority, application United Kingdom, Apr. 21, 1989, 8909066

Int. Cl.[5] F28F *27/02*

U.S. Cl. 165—101 **8 Claims**



1. A heat exchanger suitable for placing first and second fluids in heat exchange relationship with each other comprising two arrays of header tubes, which arrays are spaced apart from each other, a plurality of heat exchange tubes each header tube in one of said arrays being in flow communication with a respective header tube in the other of said arrays via said plurality of heat exchange tubes, said heat exchange tubes being so configured and disposed as to be other than normal to the operational flow of the first of said fluids thereover, the header tubes of one of said arrays being in flow communication with a first manifold, some of the header tubes in the other of said arrays being in flow communication with a second manifold and the remainder of the header tubes in said other array being in flow communication with a third manifold, pipe and valve means being provided and so arranged that in a first mode of operation said second fluid is supplied to said first manifold only, so as to flow to both of said second and third manifolds via said header and heat exchange pipes and be subsequently exhausted from said second and third manifolds, and in a second mode of operation said second fluid is supplied to said third manifold only, so that said second fluid flows from said third manifold to said second manifold via said first manifold and said header and heat exchange pipes and is subsequently exhausted from said second manifold so that said second fluid is in operation sequentially placed in parallel flow and then contra-flow heat exchange relationship with said second fluid by its passage through said heat exchange pipes.

4,962,810

HEAT EXCHANGER

William H. Bond, Del Mar, and Alex C. Yi, Cerritos, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 18, 1989, Ser. No. 408,965

Int. Cl.[5] F28F *9/26*

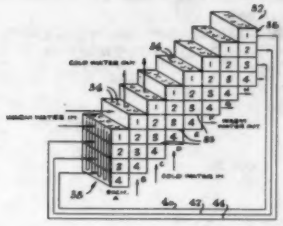
U.S. Cl. 165—143 **12 Claims**

1. A multipass heat exchanger which comprises:

a plurality of successive exchanger modules starting from a first module to a last module, each module having a plurality of individually successively numbered parallel passes starting with a first pass, for passage of a first heat exchange fluid and a plurality of tubes disposed transversely of said passes for passage of a second heat exchanger fluid,

said modules being connected in side-by-side staggered relation with each successive module adjoining the previous module in a stepped relation such that the first pass of a first module is connected to the second pass of a second module, so that the first heat exchanger fluid leaving the

first pass of the first heat exchanger module enters directly the second pass of the second module, and continuing on



in the same manner for any successive modules in a straight-through fashion, for as many passes as desired.

4,962,811

HEAT EXCHANGER

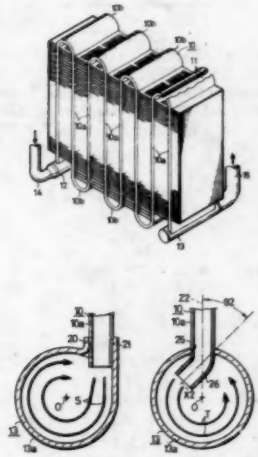
Yuji Yamamoto, Tochigi, Japan, assignor to Showa Aluminum Corporation, Sakai, Japan

Filed Oct. 17, 1989, Ser. No. 422,482

Claims priority, application Japan, Oct. 18, 1988, 63-135926[U]

Int. Cl.[5] F28F 9/02

U.S. Cl. 165—173 **2 Claims**



1. A heat exchanger comprising:

a tubular inlet header and a tubular outlet header, each formed in a respective peripheral wall with a slot extending axially thereof, the tubular outlet header is formed with the slot on a line where the peripheral wall thereof intersects a plane containing a center line of the outlet header; and

a zigzag flat tube including

a plurality of straight tube portions arranged in parallel to one another, the straight tube portion at one end of the flat tube is present in the plane containing the center line of the tubular outlet header, the straight tube portion being bent at an end thereof inserted in the tubular outlet header, and

bent portions each interconnecting immediately adjacent straight tube portions at respective ends, the straight tube portions at opposite ends of the flat tube being joined to the respective headers with an unconnected end of each straight tube portion inserted in the slot, an extension of the center line of the bent portion does not intersect the center line of the tubular outlet header.

4,962,812

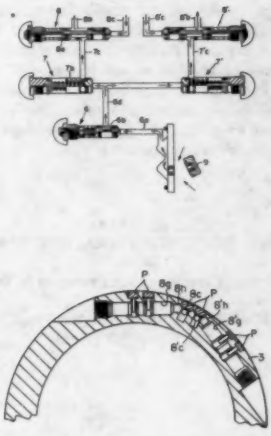
VALVING SYSTEM FOR INFLATABLE PACKERS

Vel Berzin, Houston, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Dec. 11, 1989, Ser. No. 448,522

Int. Cl.[5] E21B 33/127, 34/06

U.S. Cl. 166—187 **6 Claims**



1. A tubular system for use in packing off a well bore, comprising:

a tubular mandrel having means on its upper end for connection to a well conduit extending to the well surface;

an annular inflatable packing element surrounding said mandrel and having one end sealingly attached to the mandrel;

a tubular valve collar surrounding said mandrel and sealingly attached to the other end of said packing element;

said valve collar having a first valve receiving bore axially communicating between the well bore and bore of said mandrel;

a first fluid conduit in said valve collar radially communicating with said first valve receiving bore;

an inflation initiating valve element mounted in said first valve receiving bore and having a pair of axially spaced seals initially straddling said first fluid conduit;

said inflation initiating valve element being axially shiftable by a predetermined fluid pressure in the bore of said mandrel to a position permitting said mandrel bore pressured fluid to unrestrictedly flow into said first fluid conduit;

said valve collar defining a pair of second valve receiving bores having adjacent axial ends;

second conduit means connecting said first fluid conduit to the adjacent axial ends of both said second valve bores;

said second conduit means having a flow area equal to that of said first conduit means;

check valves respectively mounted in said second valve bores and spring biased to a position limiting fluid flow from said first conduit means;

a pair of third conduit means respectively radially communicating with said second valve bores;

the combined flow areas through said pair of third conduit means and the respective check valves being approximately double the flow area of said first conduit means and said inflation initiating valve when opened;

said valve collar defining a pair of third valve receiving bores having adjacent axial ends;

said pair of third conduit means respectively radially communicating with said third valve bores;

a pair of inflate limit valves respectively mounted in said third valve bores;

a pair of fourth conduit means respectively radially communicating with said third valve bores and the space between said mandrel and the internal surface of said inflatable packing element;

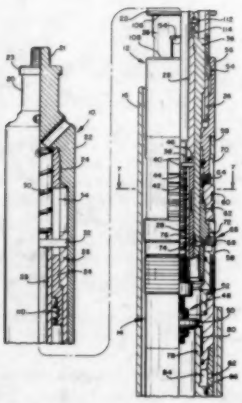
the combined flow areas through said pair of third and fourth conduit means and said inflate limit valves being approximately double that of said first conduit means and said inflation initiating valve when opened, whereby the supply of pressured fluid to the bore of said mandrel at a predetermined level in excess of the well bore pressure produces a combined fluid flow rate through each of said check valves and each of said inflate limit valves substantially equal to one half the flow rate through said inflation initiating valve when opened.

4,962,813

WELL TOOL LOCKING SYSTEM FOR STAGGERED BORE

William R. Welch, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Feb. 28, 1989, Ser. No. 316,670
Int. Cl.[5] E21B *23/00*
U.S. Cl. 166—217 **13 Claims**



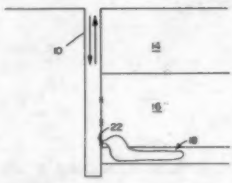
1. A lock mandrel comprising a locking key retainer sleeve; locking keys; a first set of windows in said locking key retainer sleeve; a locking sleeve slidably disposed within said locking key retainer sleeve, said locking sleeve being adapted to force said locking keys through said first set of windows; a longitudinally slidable no-go ring further comprising a split ring member adapted to circumferentially engage said locking sleeve and a plurality of unitary, outwardly extending locating dogs circumferentially spaced around said split ring member; said locking key retainer sleeve further comprising a second set of windows adapted to receive said locating dogs; and said locating dogs being further adapted to extend radially outward through said second set of windows.

4,962,814

OPTIMIZATION OF CYCLIC STEAM IN A RESERVOIR WITH INACTIVE BOTTOM WATER

Bassem R. Alameddine, Carrollton, Tex., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Sep. 28, 1989, Ser. No. 413,809
Int. Cl.[5] E21B *33/138, 43/24*
U.S. Cl. 166—288 **23 Claims**



1. A method for optimizing steam injection into an oil containing reservoir having a bottom water zone comprising:

(a) injecting via a well an oxidizing fluid into the bottom water zone in an amount sufficient to oxidize oil in said zone which causes said oil to increase in viscosity sufficient to divert steam into an upper zone of the reservoir; and

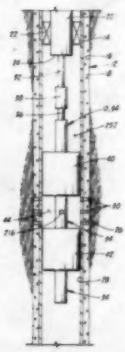
(b) ceasing injection of said fluid and commencing thereafter steam injection into the reservoir which steam is diverted from the bottom water zone and directed into an upper oil containing zone thereby improving steam injection thermal efficiency.

4,962,815

INFLATABLE STRADDLE PACKER

Roger L. Schultz, Plano, Tex., and James C. Tucker, Graham, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 17, 1989, Ser. No. 381,624
Int. Cl.[5] E21B *23/06, 33/124*
U.S. Cl. 166—387 **21 Claims**



1. A straddle packer apparatus, comprising:

a housing having a central housing opening, and having packer inflation passage means defined in said housing, and having a treating fluid passage defined in said housing with an outlet of said treating fluid passage communicating with an exterior of said housing;

upper and lower longitudinally spaced packers mounted on said housing on opposite sides of said outlet of said treating fluid passage, said packers being in communication with said packer inflation passage means;

an inner mandrel slidably received in said central housing

opening, said mandrel having a mandrel bore and having an inflation port means and a treating port means each communicated with said mandrel bore; and

lug and endless J-slot means, operably associated with said housing and said inner mandrel, for controlling a telescoping position of said mandrel relative to said housing in response to telescoping reciprocation without rotation of said mandrel relative to said housing, said mandrel being movable between an inflating position wherein said inflation port means of said mandrel is communicated with said inflation passage means of said housing and said treating port means of said mandrel is isolated from said treating fluid passage of said housing, and a treating position wherein said inflation port means of said mandrel is isolated from said inflation passage means of said housing and said treating port means of said mandrel is communicated with said treating fluid passage of said housing.

4,962,816

ARRANGEMENT FOR CONTROLLING BULLDOZER BLADE

Kazutoshi Imon; Kensuke Fukushima, both of Komatsu, and Hiroshi Shimizu, Kanazawa, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

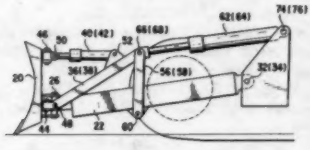
PCT No. PCT/JP87/00811, § 371 Date Apr. 19, 1989, § 102(e) Date Apr. 19, 1989, PCT Pub. No. WO88/03199, PCT Pub. Date May 5, 1988

PCT Filed Oct. 22, 1987, Ser. No. 348,482

Claims priority, application Japan, Oct. 22, 1986, 61-251358

Int. Cl.[5] E02F *3/76*

U.S. Cl. 172—821 **3 Claims**



1. An arrangement for controlling a bulldozer blade comprising: a U-shaped frame connected at the leading central part of the semi-circular portion thereof through a coupling means including a spherical shaft to the longitudinally substantially central and lower part of the rear surface of a blade in such a manner that the blade may be turned freely in all directions about said coupling means; a first arm and a second arm each being connected at one end through a bracket to the blade at two places on the rear surface thereof in such a manner that said one end of each of the arms may be turned freely, said two places corresponding to left and right positions symmetrically of the longitudinally central portion of the blade at a height which is the same as that of the coupling means between the frame and the blade; a first hydraulic cylinder and a second hydraulic cylinder each being connected at one end through a bracket to the blade at two places on the upper part of the rear surface thereof which are vertically opposite to the connections between the arms and the blade in such a manner that said one end of each of the cylinders may be turned freely; a first lever and a second lever each being connected at one end through a bracket to each of both parallel leg portions of said U-shaped frame, in such a manner that said one end of each of the levers may be turned freely, at positions substantially between the leading end of the semi-circular portion of the frame and both the rear ends thereof which are each pivotally connected through a bracket to the vehicle body; a third hydraulic cylinder whose one end is pivotally connected to a connecting portion which connects pivotally the other ends of said first arm, said first hydraulic cylinder and said first lever, respectively, or alternatively the portions of said first arm, said first hydraulic cylinder and said first lever, respectively, in the vicinity of the other ends thereof, and whose other end is pivotally connected through a bracket to the vehicle body; and a fourth hydraulic cylinder whose one end is pivotally connected to a connecting portion which connects pivotally the other ends of said second arm, said second hydraulic cylinder and said second lever, respectively, or alternatively the portions of said second arm, said second hydraulic cylinder and said second lever, respectively, in the vicinity of the other ends thereof, and whose other end is pivotally connected through a bracket to the vehicle body.

4,962,817

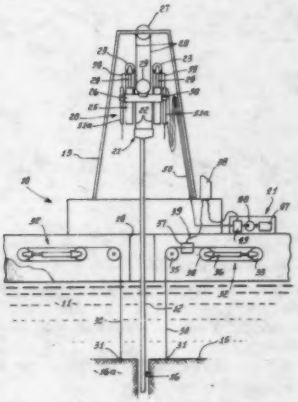
ACTIVE REFERENCE SYSTEM

Arthur B. Jones, Pasadena, Tex., and Thomas D. Cherbonnier, Singapore, Singapore, assignors to A.R.M. Design Development, Singapore

Filed Apr. 3, 1989, Ser. No. 331,752

Int. Cl.[5] E21B *19/09*; B63B *35/44*; B66F *11/04*

U.S. Cl. 175—5 **9 Claims**



1. In a motion compensation system for use on a drilling vessel that is subject to heaving due to wave actions, and wherein a motion compensator associated with a derrick supports a drill string that extends from the vessel downwardly through the seabed and into a drilled hole in the subsea formation, the compensator having rod supported sheave means, the combination that includes

(a) first means for sensing vertical motion of the vessel, due to said heaving, and for producing a signal that varies in response to said sensing,

(b) second means on the vessel for producing hydraulic fluid displacement corresponding to varying of said signal,

(c) and hydraulic fluid responsive manipulator means in the form of an actuator or actuators carried by the derrick and operatively connected to the compensator rod supported sheave means for manipulating said compensator vertically in correspondence to said hydraulic fluid displacement, thereby to maintain the drill string substantially motionless vertically,

(d) said compensator including cables and pulleys, and a frame connected with said cables and pulleys and said manipulator means includes at least two vertical actuators each including cylinder and plunger elements, one of the elements connected to the compensator rod supported sheave means and the other of the elements connected to the frame,

(e) said second means including an hydraulic fluid pump, and a four-way directional control valve connected between the pump and the actuator means for controllably deliver-

ing pressure to opposite ends of the actuators in response to shifting of the valve which is so shifted in response to variations in said electrical signal.

4,962,818

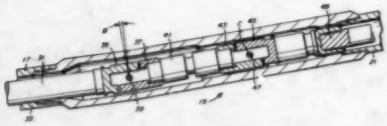
DOWNHOLE MOTOR WITH AN ENLARGED CONNECTING ROD HOUSING

Frank DeLucia, Aberdeen, Scotland, assignor to Smith International, Inc., Houston, Tex.

Continuation of Ser. No. 380,426, Jul. 17, 1989, Pat. No. 4,932,482. This application Mar. 28, 1990, Ser. No. 500,321

Int. Cl.[5] E21B *4/02*; F03B *3/04, 13/02*

U.S. Cl. 175—75 **3 Claims**



1. A downhole motor of the tubular type comprising:

a first elongated motor housing of a predetermined outside diameter;

a second elongated motor housing located adjacent to the first motor housing;

an angular bend formed on the second motor housing at a predetermined location; and

the second motor housing have an enlarged housing section of a predetermined outside diameter larger than the outside diameter of the first motor housing, said enlarged housing section having a smooth continuous annular exterior surface.

4,962,819

MUD SAVER VALVE WITH REPLACEABLE INNER SLEEVE

Thomas F. Bailey, and Raymond A. Todd, Jr., both of Houston, Tex., assignors to Drilex Systems, Inc., Houston, Tex.

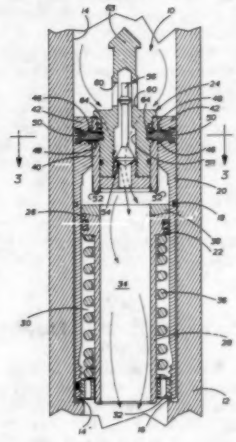
Filed Feb. 1, 1989, Ser. No. 305,213

Int. Cl.[5] E21B *21/10*; F21K *51/00*

U.S. Cl. 175—218 **14 Claims**

1. In a mud saver valve for retaining drilling mud within a drill string when downhole pumping of the mud is interrupted, the mud saver valve including a tubular housing adapted to be received within the drill string, the housing receiving an upwardly biased, axially movable piston having a fluid passageway to permit the flow of fluids through the valve when the mud is being pumped downhole and a closure plug removably received within the upper end of the mud saver valve, the closure plug including check valve means to permit the upward flow of mud through the mud saver valve to relieve downhole fluid pressure, the improvement comprising:

a selectively replaceable inner sleeve supported within the upper end of the mud saver valve by at least one retaining bolt and matingly receiving the removably closure plug, said inner sleeve including a lower end engageable with



the piston to prevent the flow of fluid through the fluid passageway.

4,962,820

DEVICE FOR PRODUCING DRILL HOLES HAVING AN UNDERCUT

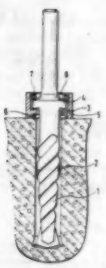
Artur Fischer, Waldachtal, Fed. Rep. of Germany, assignor to fischerwerke Artur Fischer GmbH & Co. Kg, Waldachtal/-Tumlingen, Fed. Rep. of Germany

Filed Oct. 27, 1989, Ser. No. 428,168

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1988, 3836548

Int. Cl.[5] E21B *1/00*

U.S. Cl. 175—220 **6 Claims**



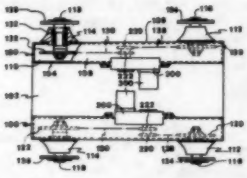
1. A drilling device for producing drill holes having an undercut said device comprising a drilling tool to be inserted into a drilling machine and including a drilling shaft having a free end; a drilling head with a drilling plate located on said free end of said drilling shaft; a stop sleeve mounted on the drilling shaft at a location remote from said drilling head and having a first opening for guiding said drilling shaft and a second opening located axially further away from said drilling head than said guide opening; a stop collar formed integrally with said drilling shaft and located inside said stop sleeve; and an annular spring for axially securing said stop collar to said stop sleeve in an area of said second opening of said stop sleeve.

4,962,821

DISCRETE DRIVE SYSTEM FOR A SKID STEER LOADER

Jong R. Kim, Incheon, Rep. of Korea, assignor to Daewoo Heavy Industries Ltd., Rep. of Korea

Filed Mar. 22, 1989, Ser. No. 327,347
Int. Cl.[5] B62D *11/04*; F16H *57/02*; F16D *49/00*
U.S. Cl. 180—6.48 12 Claims



1. A discrete drive system for propelling a skid steer loader in different directions which comprises in combination:

a main frame including a pair of side beams and a cross beam;

a pair of parallelly spaced, elongated transmission cases integrally formed with the side beams of said frame for transmitting drive force from a hydrostatic motor to front and rear stub axles;

each of said transmission cases including an inner side wall, an outer side wall spaced apart from said inner side wall and tubular axle housings outwardly extending from said outer wall to rotatably support said stub axles, said inner side wall having an opening;

connection means for interconnecting said pair of transmission cases to define a longitudinally extending compartment, said compartment receiving at least partially an engine for the loader and a hydraulic pump;

gear reduction means mounted on the inner side wall of each of said transmission cases, said gear reduction means driving a pair of drive sprockets operatively connected to driven sprockets of said stub axles; and

said gear reduction means including an outer casing rigidly secured to said inner side wall, a first output shaft having an outer end extending through said opening into said transmission case and a second output shaft associated with said hydrostatic motor, said first output shaft carrying a reduction gear mounted thereon, said second output shaft carrying a pinion gear parallelly spaced apart from said reduction gear, said reduction gear and said pinion gear operatively coupled with each other to drive said drive system at a reduced speed, said outer end of the first output shaft carrying said drive sprockets operatively connected to the driven sprockets on the stub axles through endless chains.

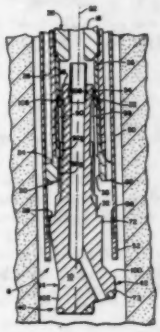
4,962,822

DOWNHOLE DRILL BIT AND BIT COUPLING

Jack H. Pascale, Bloomsbury, N.J., assignor to Numa Tool Company, Thompson, Conn.

Filed Dec. 15, 1989, Ser. No. 451,301
Int. Cl.[5] E21B *10/26, 10/66*
U.S. Cl. 175—258 19 Claims

11. A downhole hammer bit having an enlarged front drill bit head and a rear elongated drive shank having a front section of external splines and a rear reduced section, the front section of external splines providing part of a drive coupling for rotation of the bit during drilling with the bit in a retracted, coaxial, working position thereof, the drill bit head having a drill bit sector coaxial with the bit and largely on one side of the axis thereof for drilling an enlarged hole upon rotation of the bit, the drive shank having means, which includes the front section of external splines, for coaxially positioning the drive shank in the retracted, working position of the bit and means, which includes the rear reduced section of the drive shank, for permitting lateral movement of the drive shank in an extended,



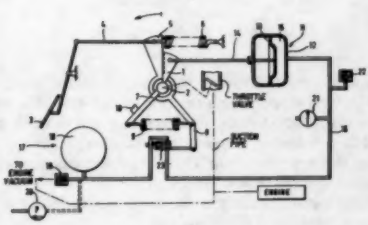
non-working position of the bit, thereby to permit the drill bit sector to swing inwardly.

4,962,823

LOAD-ADJUSTING DEVICE

Jürgen Luft, Bad Soden, and Eckhart Kern, Hofheim, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 8, 1988, Ser. No. 179,522
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3712428
Int. Cl.[5] B60K *26/04*
U.S. Cl. 180—197 8 Claims



1. In a load-adjusting system having a control lever which determines the output of an internal combustion engine in response to movement of an accelerator pedal, the system including an intermediate lever and a coupling spring, the control lever being held by the coupling spring against the intermediate lever, the intermediate lever being driven by the accelerator pedal, the control lever being urged by said intermediate lever and said coupling spring to follow a movement of the intermediate lever due to the force of the coupling spring; the improvement wherein the system further comprises:

a damping device coupled to the control lever to counteract a sudden movement of the control lever; and wherein

the damping device comprises a cylinder, and a piston which is coupled with the control lever, the piston being supported in the cylinder for movement therein;

there is a pressure chamber within the cylinder, and the piston is disposed in sealing fashion within the cylinder and forms a wall of the pressure chamber; and

the system further comprises vent choke means for bleeding off pressure from said pressure chamber;

an excess pressure means communicating with the atmo-

sphere, a connection from the cylinder to a source of vacuum and to the vent choke means, and a blocking device operatively coupled via the intermediate lever to the accelerator pedal for inhibiting a communication of vacuum via the connection from the source of vacuum upon actuation of the accelerator pedal.

4,962,824

TRACTION CONTROL SYSTEM FOR MOTOR VEHICLES

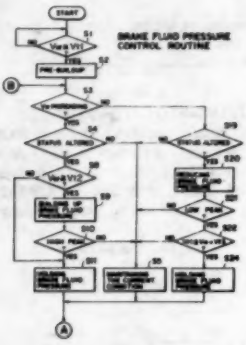
Naoyuki Hagiya, Ageo, and Toshifumi Machara, Osato, both of Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo and Akebono Research and Development Centre Ltd., Saitama, both of, Japan

Filed May 22, 1989, Ser. No. 355,901

Claims priority, application Japan, May 26, 1988, 63-126951

Int. Cl.[5] B60T *8/32*

U.S. Cl. 180—197 **7 Claims**



1. A traction control system for motor vehicles, wherein a slip of a driving wheel which tends to occur when the motor vehicle starts or accelerates, is detected; and a braking force imparted to said driving wheel is controlled on the basis of said detection, thereby restraining the slip of said driving wheel, said traction control system comprising:

(a) Wheel speed detecting means for detecting left-hand and right-hand driving wheel speeds;

(b) Threshold value setting-up means for setting up a plurality of predetermined threshold values in relation to the vehicle speed, said threshold value being higher than said vehicle speed and being determined by adding a predetermined value to the higher one of left-hand and right-hand non-driving wheel speeds; and a computed vehicle speed is determined from the higher one of the left-hand and right-hand non-driving wheels; and

(c) means for effecting buildup or reduction of the brake fluid pressure on the basis of a comparison of the speed of said driving wheel as acceleration or deceleration and said plurality of predetermined threshold values, and for causing a holding mode in which the brake fluid pressure is held to occur at a time point when the driving wheel speed changes from increase to decrease; and

(d) means for switching said holding mode to a buildup mode in which the brake fluid pressure is increased when the brake fluid pressure holding mode has continued for or longer than a predetermined time period while said driving wheel speed is higher than a specific one of said plurality of threshold values such that excessive reduction of brake fluid pressure is prevented thus preventing vibration from occurring in said vehicle during traction control.

4,962,825

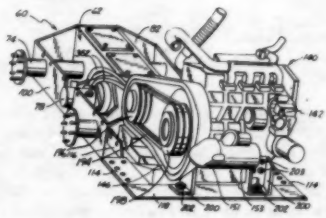
SKID STEER LOADER

Larry E. Albright, Gwinner; Joseph M. Mather; Orlan J. Loraas, both of Lisbon, and Carman Lynnes, Leonard, all of N. Dak., assignors to Clark Equipment Company, South Bend, Ind.

Continuation of Ser. No. 234,392, Aug. 19, 1988, abandoned, which is a division of Ser. No. 108,128, Oct. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 87,900, Aug. 21, 1987, Pat. No. 4,815,550. This application Nov. 6, 1989, Ser. No. 433,388

Int. Cl.[5] B60K *5/00, 17/00*

U.S. Cl. 180—292 **10 Claims**



1. A lower frame subassembly used to manufacture a skid steer loader of the type having a main frame subassembly including a pair of longitudinally extending and laterally spaced side members configured for mounting to the lower frame subassembly, the lower frame subassembly comprising:

an elongated, tubular transmission case having side walls and front and back walls;

a pair of side flanges, each spaced from and mounted with respect to one of the side wall of the transmission case, free from side members of a main frame subassembly and configured to receive respective side members of a main frame subassembly;

an engine mount platform secured to and extending from the back wall of the transmission case, the engine mount platform having side portions free from side members of a main frame subassembly and configured to receive side members of a main frame subassembly;

an engine mounted to the engine platform; and

a hydraulic pump mounted to the engine mount platform.

4,962,826

DAMPING TREATMENT FOR PIPES AND BODIES

John R. C. House, Wimbourne, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, Great Britain

PCT No. PCT/GB87/00779, § 371 Date Apr. 4, 1989, § 102(e) Date Apr. 4, 1989, PCT Pub. No. WO88/03628, PCT Pub. Date May 19, 1988

PCT Filed Nov. 4, 1987, Ser. No. 340,300

Claims priority, application United Kingdom, Nov. 5, 1986, 8626408

Int. Cl.[5] F16F *15/00*

U.S. Cl. 181—207 **12 Claims**

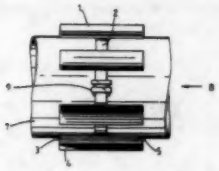
1. A vibration damper for hot pipes, said pipes having a maximum temperature, said damper comprising:

two rigid plates, said plates having a length;

a layer of viscoelastic material disposed between said two rigid plates;

support means connected to one of the plates, for attaching said one plate to the said pipe; and

a thermally insulating barrier means, disposed in a thermal path between said viscoelastic material and said pipe, for



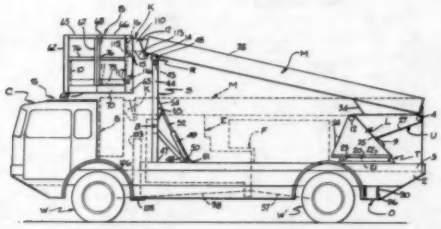
preventing temperature induced inefficiency of the viscoelastic materials damping characteristics.

4,962,827

EXTENDABLE, ELEVATABLE, ROTATABLE, COLLAPSIBLE BOOM AND BASKET FOR VEHICLES

Edward V. Garnett, 9152 Kahului Dr., Huntington Beach, Calif. 92646

Filed Jul. 18, 1989, Ser. No. 381,771
Int. Cl.[5] B66F *11/04*
U.S. Cl. 182—2 19 Claims



1. A boom and a basket for a rescue, crash or service vehicle, comprising:

an extendable, elevatable and rotatable boom for mounting on a vehicle, said boom being movable to a retracted and lowered position disposed longitudinally along the upper portion of said vehicle; and

a basket mounted on the outer end of said boom and longitudinally collapsible, whereby said basket may be stored at the outer end of said boom to occupy a substantially lesser amount of longitudinal space.

4,962,828

DEBRIS NET/SCAFFOLDING FRAME LIFTING SYSTEM

Charles W. Duncan, 2725 Fremont La., Costa Mesa, Calif. 92626

Continuation-in-part of Ser. No. 313,089, Feb. 21, 1989, Pat. No. 4,892,169. This application Jan. 4, 1990, Ser. No. 461,010
Int. Cl.[5] E04G *3/10, 21/30, 21/32*
U.S. Cl. 182—82 23 Claims

1. A lifting system for climbing a series of vertically spaced construction platforms comprising:

a plurality of laterally spaced lifting units anchorable to said platforms;

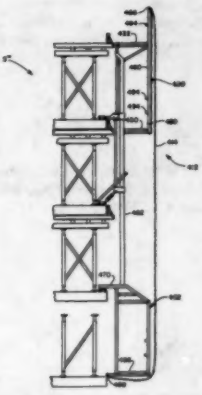
scaffolding frame means suspended from said lifting units so as to extend generally laterally and outwardly from said platforms at a first pre-selected vertical height;

each said lifting unit comprising:

first frame means comprising inner upper and inner lower attachment means for independent mounting to respective spaced platforms;

second frame means slidably coupled to said first frame means comprising outer upper and outer lower attachment means for independent mounting to respective spaced platforms, said second frame means comprising mounting means for mounting said scaffolding frame means;

so that one said frame means may be vertically displaced from said first height to a second vertical height while



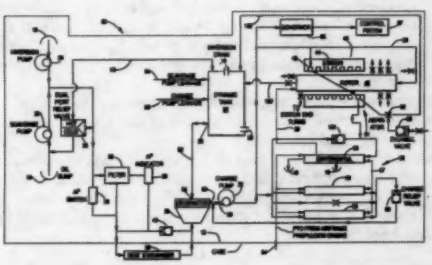
the other said frame means is mounted in fixed relationship to selected platforms with the scaffolding frame means suspended from said unit and supported on said selected platforms during the vertical displacement of said one frame means.

4,962,829

OIL MANAGEMENT TANK SYSTEM

Kenneth B. Sugden, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 17, 1989, Ser. No. 324,752
Int. Cl.[5] F01M *11/08*
U.S. Cl. 184—6.23 17 Claims



1. An oil management system for a case containing at least one rotating element which requires a supply of pressurized oil during rotation comprising:

an oil sump within the case for collecting the oil after lubrication of the at least one rotating element;

a tank within the case for containing oil during lubrication of the at least one rotating element and having an outlet;

a first means having an outlet for supplying pressurized oil to the at least one rotating element;

a second means having an inlet coupled to the sump and at least one outlet coupled to the first means and to the outlet of the tank;

the outlet from the tank being coupled to the second means, the tank being disposed above the second means and providing a pressure head at the outlet of the tank during

a non-inverted operation which opposes the pressure produced by the second means; and

when oil pressure at the outlet of the second means is greater than the oil pressure at the outlet of the tank, the second means provides pressurized oil to the tank and to the inlet of the first means and when oil pressure at the at least one outlet of the second means is less than oil pressure at the outlet of the tank, oil from the tank flows to the inlet of the first means.

4,962,830

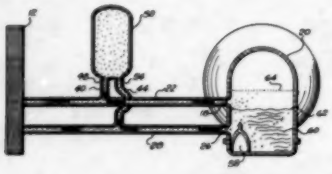
DUAL TRANSMISSION-FLUID-LEVEL MAINTENANCE SYSTEM

Frank Potts, 15331 Palomino Blvd., Fountain Hills, Ariz. 85268

Filed Sep. 18, 1989, Ser. No. 408,871

Int. Cl.[5] F01M *1/16, 11/12*

U.S. Cl. 184—6.4 **20 Claims**



1. A fluid level maintenance apparatus for use with an automatic transmission system of a motor vehicle, said transmission system including:

a housing having a fluid inlet and a fluid outlet, said housing being dimensioned to retain an operational volume of a fluid,

a heat exchanger having a fluid inlet and a fluid outlet, said heat exchanger fluid inlet being coupled to said housing fluid outlet, and said heat exchanger fluid outlet being coupled to said housing fluid inlet, and

means, coupled to one of said housing fluid inlet and outlet, for urging movement of said fluid;

said fluid level maintenance apparatus being for maintaining substantially said operational volume of said fluid in said housing when said urging means is operational and for supplying an additional volume of said fluid to said housing when said urging means is inoperative, said apparatus comprising:

a container having first and second openings therein;

means for coupling said first opening of said container to said housing fluid inlet; and

means for coupling said second opening of said container to said housing fluid outlet, said container and at least one of said coupling means being collectively dimensioned to enclose a volume substantially equal to said additional volume of fluid.

4,962,831

APPARATUS FOR CONTROLLING LUBRICATING OIL FIRES DUE TO OIL LINE FAILURE

Robert E. Dundas, Duxbury, Mass., assignor to Factory Mutual Research, Norwood, Mass.

Filed Sep. 14, 1989, Ser. No. 407,304

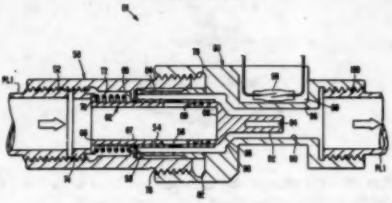
Int. Cl.[5] F01M *1/18*

U.S. Cl. 184—108 **24 Claims**

1. Apparatus for controlling lubricating oil fires around a machine having bearings to which lubricating oil is fed under pressure through at least one conduit, comprising:

means mounted in said conduit for stopping the flow of lubricating oil through the conduit in response to a greater than normal flow of oil through said conduit downstream of said flow stopping means, said flow stopping means comprising a valve seat and a valve element movable from a first position spaced from said valve seat to a second position engaging said valve seat; and

means associated with said flow stopping means for shutting down the machine in response to said valve element moving at least part way from said first position to said second position,



whereby the flow of lubricating oil is stopped and the machine is shut down when there is a break in the conduit.

4,962,832

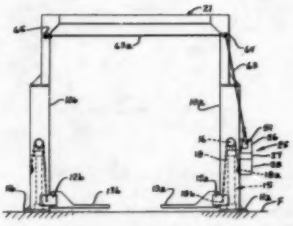
VEHICLE LIFT WITH LIFT LIMIT CONTROL

Jeffrey H. Maney, Rockford, Ill., assignor to Mechanical Tool & Engineering Co., Rockford, Ill.

Filed Feb. 9, 1989, Ser. No. 308,012

Int. Cl.[5] B66B *1/00*

U.S. Cl. 187—110 **3 Claims**



1. In a hydraulically operated vehicle lift including a pair of spaced upright columns, vehicle lift carriage means mounted for vertical movement on the columns, means including a linear hydraulic actuator means on at least one column for raising and lowering the vehicle lift carriage means, an electro-hydraulic power unit mounted on one column, the power unit including pump means hydraulically connected to the linear hydraulic actuator means, electric motor means drivingly connected to the pump means and having motor conductors, a junction box mounted on the motor pump unit with the motor conductors extending thereinto, and a control switch means mounted in the junction box and operable between a conducting and a non-conducting condition, manually operable control switch actuator means external of the junction box for selectively operating control switch means from a non-conducting to a conducting condition, the improvement comprising a second switch means mounted in the junction box and operable between a conducting and non-conducting condition, second switch actuator means external of the junction box, the second switch means and said control switch means being electrically connected inside the junction box in a circuit with said motor conductors to energize the motor means only when both switch means are in a conducting condition, and flexible switch operating line means having one end connected to the second switch actuator means, said switch operating line means having a portion extending crosswise between the pair of columns at a selected height for engagement with a vehicle being lifted, the second switch means and the second switch actuator means being arranged to operate the second switch

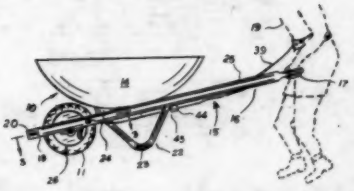
means to a conducting condition when the tension in the switch operating line is below a preset value and to a non-conducting condition when the tension in the switch operating line exceeds said preset value.

4,962,833

BRAKE SYSTEM FOR A WHEELBARROW

Kal B. McCurdy, 20 Roberts Ave., San Rafael, Calif. 94901

Filed Oct. 3, 1989, Ser. No. 416,725
Int. Cl.[5] B62B *5/04*; F16D *65/30*
U.S. Cl. 188—2 R 5 Claims



1. A brake system for a wheelbarrow comprising a tub-like container, a supporting framework having two elongated handles and support legs, and a wheel positioned below the forward extremity of said container and rotatively held by an axle journaled to the handles adjacent the lowermost extremities thereof, said brake system comprising:

(a) a stationary plate disposed upon said axle in perpendicular disposition thereto,

(b) means for anchoring said plate to an adjacent handle,

(c) an arcuate lever pivotably attached at a first extremity to said plate, and having an opposite second extremity having cable-engaging means,

(d) a friction brake lining in the shape of an arc of a circle movably associated with said plate and adapted to be contacted by the pivoted first extremity of said lever and thereby urged radially outward from said plate,

(e) a drum surface attached to said wheel and rotatable therewith, said drum surface having a radius to match the arc of said lining, and positioned to be contacted by said lining when outwardly urged by said lever,

(f) a cable having a proximal extremity which attaches to the second extremity of said lever and extends rearwardly to a free distal extremity, and

(g) a belt having quick release means and adapted to be worn by the operator of the wheelbarrow, said belt being attached to the distal extremity of said cable, whereby

(h) when the cable is pulled, as when the wheelbarrow is separated from the operator, the lever forces the lining into contact with the drum surface, thereby preventing movement of the wheelbarrow.

4,962,834

THREADED REMOVABLE END MOUNT SYSTEM FOR SHOCK ABSORBERS

Lewis B. Miner, 10608 Rookwood Dr., San Diego, Calif. 92131, assignor to Walter K. Napoleon and Lewis B. Miner, both of San Diego, Calif.

Filed Jun. 14, 1989, Ser. No. 366,149
Int. Cl.[5] F16F *9/00*
U.S. Cl. 188—321.11 2 Claims

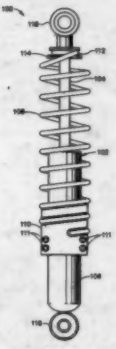
1. An interchangeable stud end mount for stabilizer shock absorbers having a piston rod which reciprocates inside a shock absorber barrel and wherein said piston rod and said barrel are additionally connected by a helical coil tension spring, comprising:

a stabilizer shock absorber having a piston rod which includes an externally threaded surface portion adjacent to a distal end which is located external to said shock absorber barrel;

a stud mount having an internally threaded bore which is threadably secured onto said thread portion of said piston rod, wherein said stud mount comprises:

a washer with a central aperture; and

a stud having a first end externally threaded and a second end with said internally threaded bore, positioned with said second end circumference substantially concentric



to said washer aperture and affixed thereto, said second end having an external circumference greater than said first end; and

a spring seat having a central aperture to engage said threaded portion of said piston rod and supported on said piston rod by a portion of said piston rod of greater diameter than said spring seat aperture so as to cooperate with said stud mount to retain an end of said spring and prevent said spring from travelling away from the direction of piston rod movement during shock absorber extension.

4,962,835

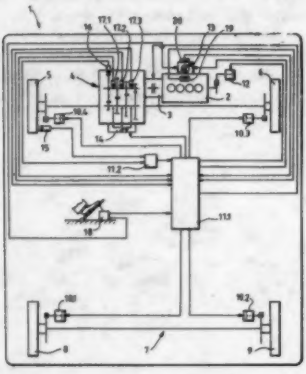
SYSTEM FOR PREVENTING UNDESIRED VEHICLE ACCELERATION

Ludwig Prüss, Braunschweig, Fed. Rep. of Germany, assignor to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

Filed May 19, 1989, Ser. No. 354,489
Claims priority, application Fed. Rep. of Germany, May 19, 1988, 3817097
Int. Cl.[5] B60K *41/28*
U.S. Cl. 192—0.03 14 Claims

1. Apparatus for preventing undesired acceleration of a vehicle comprising a drive train including an engine, transmission means and vehicle drive wheel means, engine speed increase means for automatically increasing the engine speed, control means for the engine speed increase means, accelerator means for controlling the engine speed by an operator of the vehicle, and means responsive to the control means for preventing transmission of driving power to the drive wheel means if the drive train is not disengaged within a predetermined period of time after actuation of the engine speed in-

crease means and the accelerator means is not requiring increased engine speed, including sensor means for detecting



disengagement of the drive train and supplying corresponding signals to the control means.

4,962,836

FLUID FRICTION CLUTCH

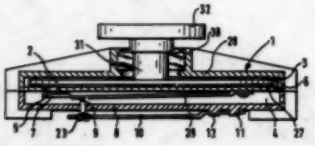
Hans Martin, Stuttgart, Fed. Rep. of Germany, assignor to Süddeutsche Kühlerfabrik Julius Fr. Behr GmbH & Co. KG, Fed. Rep. of Germany

Filed May 16, 1989, Ser. No. 352,409

Claims priority, application Fed. Rep. of Germany, May 20, 1988, 3817226

Int. Cl.[5] F16D *35/00, 43/25*

U.S. Cl. 192—58 B **8 Claims**



1. A fluid friction clutch having a housing which has a working chamber receiving a rotatable drive disk, a storage chamber for clutch fluid, which is separated from this working chamber, and connection openings between the working chamber and the storage chamber for guiding the clutch fluid back and forth between the working chamber and the storage chamber, the inlet opening to the working chamber being openable and closable by a valve which is controlled as a function of temperature by way of an actuating pin penetrating a cover of the storage chamber, said cover being located on a side of the storage chamber facing away from the working chamber, said actuating pin acting upon said valve and being carried by a bimetallic element that is disposed transversely on the outside of the cover, wherein the bimetallic element exhibits first and second oppositely disposed end portions, wherein said bimetallic element is fixedly held with respect to said cover at only its first end portion with said second end portion being freely movable with respect to the cover, said second end portion carrying said actuating pin for movement therewith.

4,962,837

VISCOUS COUPLING CLUTCH

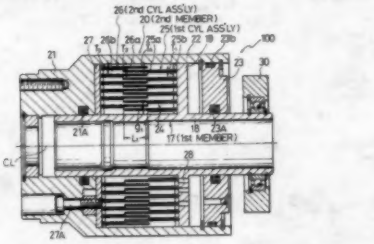
Masao Teraoka, Tochigi, Japan, assignor to Tochigifujisangyo Kabushiki Kaisha, Japan

Filed Nov. 14, 1989, Ser. No. 437,461

Claims priority, application Japan, Nov. 14, 1988, 63-285820; Nov. 29, 1988, 63-299756

Int. Cl.[5] F16D *31/00*

U.S. Cl. 192—58 C **5 Claims**



1. A viscous coupling clutch comprising:

(a) a first rotatable member;

(b) a second rotatable member rotatably and slidably disposed relative to said first rotatable member so as to form a working chamber filled with a viscous fluid;

(c) a first cylinder assembly having plural first resistance cylinder members of different diameters and coaxially fixed to said first rotatable member within the working chamber, a radial thickness of each of said first resistance cylinder members changing stepwise along an axial direction thereof;

(d) a second cylinder assembly having plural second resistance cylinder members of different diameters and coaxially fixed to said second rotatable member within the working chamber, a radial thickness of each of said second resistance cylinder member changing stepwise along the axial direction thereof, said first and second resistance cylinder members being engaged with each other in radially spaced and axially slidable positional relationship to each other so that overlap and gap conditions between said first and second resistance cylinder members change stepwise and therefore viscous coupling conditions change stepwise within the working chamber, when said first and second rotatable members are axially moved relative to each other.

4,962,838

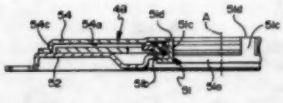
VISCOUS DAMPER WITH LOW SEAL DRAG TORQUE

Stephen M. Clancey, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 29, 1989, Ser. No. 414,860

Int. Cl.[5] F16D *3/14*

U.S. Cl. 192—106.1 **8 Claims**



1. A viscous shear mechanism including annular housing and clutch assemblies adapted for relative rotation about a common axis; the housing assembly including first and second relatively thin, radially extending sidewalls having mutually facing sidewall surfaces defining an annular radially extending compartment closed by means sealing and securing the sidewalls against relative rotational and axial movement at the radially outer extent of the compartment; the clutch assembly

including radially inner and outer portions, the outer portion having oppositely facing radially extending surfaces disposed in close axially spaced relation from the sidewall surfaces for viscous clutching coaction therebetween via a viscous shear liquid in the compartment, the inner portion extending radially inward of the housing; the radially inner extent of the compartment closed by dynamic seal means cooperating between radially inner portions of the sidewalls and oppositely facing sides of the clutch assembly characterized by:

the radially inner portions of the sidewalls defining axially facing and axially spaced apart seal surfaces cooperating with the seal means; and

a spacer ring of predetermined axial length cooperating with the sidewalls at positions substantially adjacent to the dynamic seal means for establishing a predetermined axial spacing between the seal surfaces, the spacer ring including a ring portion having at least two finger portions extending axially therefrom and freely through clutch assembly openings allowing relative rotation between the clutch assembly and the spacer ring.

4,962,839

DUCTING FOR TRANSPORTING GRANULAR OR POWDER SUBSTANCES UNDER GRAVITY, IN PARTICULAR ON SITES HAVING SILOS

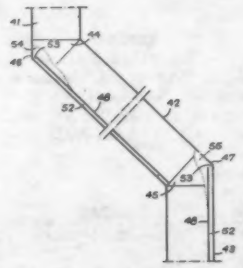
Michel Guerid, Chemille, France, assignor to Guery S.A.R.L. (Societe a Responsabilite Limitee), France

Filed May 24, 1989, Ser. No. 356,117

Claims priority, application France, Jun. 3, 1988, 88 07455

Int. Cl.[5] B65G *11/16*

U.S. Cl. 193—2 R **21 Claims**



1. In ducting having a quadrangular crosssectional area and forming a duct chamber for transporting granular substances by gravity, the ducting comprising a pair of opposed flat panels and a pair of opposed channel panels having rims contacting margins of the flat panels and a plurality of fixing means passing from the outside through the margins and the rims after being placed in contact, the improvement comprising:

said rims being coplanar and projecting outward in order to enable removal of any one of said panels while leaving the other panels assembled;

said fixing means accessible from outside said ducting; and

one of said panels situated in an abrasion zone cooperating with an additional panel substantially parallel thereto forming a tunnel therebetween for attenuating effects of wear.

4,962,840

CONTROL SYSTEM FOR CIGARETTE MAKING AND PACKAGING SYSTEM

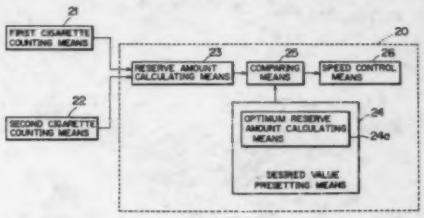
Norimasa Miura, and Yoshihisa Sato, both of Tokyo, Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 142,317, Dec. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 921,896, Oct. 24, 1986, abandoned, which is a continuation of Ser. No. 646,315, Aug. 30, 1984, abandoned. This application Jul. 17, 1989, Ser. No. 380,765

Claims priority, application Japan, Sep. 2, 1983, 58-160253

Int. Cl.[5] B65G *1/00*

U.S. Cl. 198—347.1 **3 Claims**



1. A control system for a cigarette making and packaging system including a cigarette making machine, a cigarette packaging machine with a variable operation speed, and a reservoir mechanism provided between the cigarette making machine and the cigarette packaging machine, a current reserve amount calculating means for calculating a current reserve amount in said reservoir mechanism, an intermediate reserve amount calculating means for calculating an intermediate reserve amount, a desired value setting means for setting a maximum reserve amount and a minimum reserve amount of said reservoir mechanism on the basis of said intermediate reserve amount, a comparison means for comparing said current reserve amount with said maximum reserve amount and said minimum reserve amount, and a speed control means for controlling the speed of said packaging machine on the basis of a comparison result by said comparison means;

wherein said control system operates with hysteresis characteristics in which

said operation speed of the cigarette packaging machine is switched from a low speed to a medium speed when the present reserve amount in said reservoir mechanism increass from a minimum reserve amount to an intermediate reserve amount;

said operation speed of the cigarette packaging machine is switched from the medium speed to a high speed when the present reserve amount in said reservoir mechanism increases from the intermediate reserve amount to a maximum reserve amount;

said operation speed of the cigarette packaging machine is switched from the high speed to the medium speed when the present reserve amount in said reservoir mechanism decreases from the maximum reserve amount to an intermediate reserve amount;

said operation speed of the cigarette packaging machine is switched from the medium speed to the low speed when the present reserve amount in said reservoir mechanism decreases from the intermediate reserve amount to the minimum reserve amount; and wherein

said intermediate reserve amount is updated periodically with a predetermined period of time in such a way that a new value of said intermediate reserve amount for the following period of time is based on the average down time of said cigarette making machine and the average down time of said cigarette packaging machine over the immediately preceding period of time, said intermediate reserve amount being set to a lower value if the average down time of said cigarette packaging machine is greater than that of said cigarette making machine and set to a

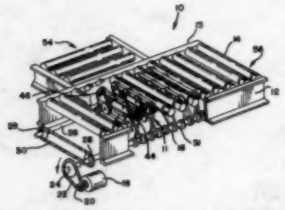
higher value if the average down time of said cigarette packaging machine is less than that of said cigarette making machine, while also said maximum reserve amount and said minimum reserve amount being updated by the same amount as said intermediate reserve amount is updated.

4,962,841

OPPOSITE DIRECTION TRANSFER DEVICE

Donald H. Kloosterhouse, Zeeland, Mich., assignor to Ermanco Incorporated, Spring Lake, Mich.

Filed Feb. 28, 1989, Ser. No. 316,979
Int. Cl.[5] B65G *37/00*
U.S. Cl. 198—372 **15 Claims**



1. An opposite direction transfer device for use with a conveyor system, comprising:

a frame;

a lift table mounted for vertical movement on said frame;

guide means positioned on said lift table for guiding a conveying member thereon, said guide means including a plurality of vertically disposed transfer wheels rotationally mounted on a first support bracket oriented within a vertically extending first plane, said first support bracket being affixed to and extending above said lift table and at least two idler wheels rotatably mounted below said transfer wheels, said idler wheels being mounted on a second support bracket extending down from said lift table, said second support bracket oriented within a second plane, said second plane intersecting said first plane beneath said lift table;

power means for driving said conveying member, said power means including a drive shaft, said conveying member being reeved around said drive shaft and around said guide means such that rotation of said drive shaft drives said conveying member on said guide means; and,

positioning means for positioning said lift table in a raised position or in a lowered portion, said positioning means being operatively associated with said lift table;

whereby, said conveying means transfers articles from a second conveyor to a first conveyor, or vice versa, when said lift table is in said raised position.

4,962,842

APPARATUS FOR CONVERTING A MULTI-ROW STREAM OF UPRIGHT ARTICLES, IN PARTICULAR BOTTLES, TO A SINGLE ROW

Alfredo Limoni, Parma, Italy, assignor to Simonazzi A. & L. S.p.A., Parma, Italy

Filed Oct. 31, 1988, Ser. No. 265,006
Claims priority, application Italy, Dec. 4, 1987, 3719 A/87
Int. Cl.[5] B65G *47/52*
U.S. Cl. 198—443 **2 Claims**

1. Apparatus for converting a multi-row stream of upright articles, in particular bottles, into a single row, said apparatus comprising:

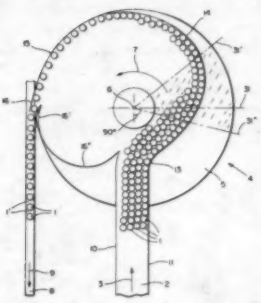
a rectilinear supply conveyor for supplying upright articles in adjacent rows,

an intermediate conveyor including a rotating conical surface located adjacent to said supply conveyor,

a removal conveyor,

a frame-fixed guide surface extending spirally outwardly along said conical surface in the direction of rotation of said conical surface,

a guide surface of said supply conveyor extends in an arc at an end region in a direction opposite to a spiral arc of said frame-fixed guide surface and then merges into said spiral arc of said frame-fixed guide surface for continuous supply of upright articles to said conical surface from said supply conveyor while the upright articles are in contact with



said guide surface and with at least some upright articles contacting said arc at said end region and conveying the upright articles to said conical surface with said at least some upright articles in contact with said frame fixed guide surface so as to avoid abrupt movements onto said frame fixed guide surface,

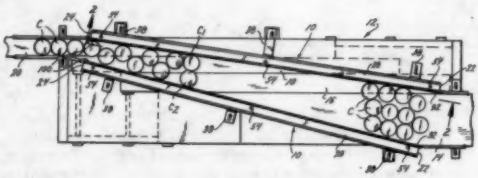
said guide surface at said end region of said supply conveyor extends radially inwardly towards a center of said conical surface of said intermediate conveyor and terminating radially inwardly of an outer peripheral edge of said conical surface for delivery of upright articles to said conical surface.

4,962,843

COMBINER RAILS

Joseph F. Ouellette, Glendale, Mo., assignor to Ouellette Machinery Systems, Inc., Fenton, Mo.

Filed Feb. 13, 1989, Ser. No. 309,239
Int. Cl.[5] B65G *47/12*
U.S. Cl. 198—453 **9 Claims**



1. In a conveyor system for conveying containers, a combiner rail for installation as one side wall of the conveyor system in an area where an accumulation of containers in a relatively wide span is to be reduced to a single file of the containers in a narrow span, the combiner rail comprising:

means for supporting and securing a plurality of rollers in each of a plurality of horizontal rows with each roller rotatable on a vertical axis independent of the axes of the remaining rollers,

means for mounting each horizontal row of rollers,

and means for simultaneously staggering the axes of the

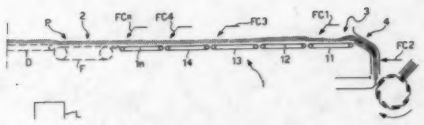
rollers in one horizontal row relative to the axes of the rollers in at least two other horizontal rows by adjusting at least one mounting means relative to at least two other mounting means.

4,962,844

METHOD FOR REGULATING THE ADVANCE OF PRODUCTS IN AUTOMATIC PACKAGING EQUIPMENT, AND EQUIPMENT OPERATING ACCORDING TO THE METHOD

Renzo Francioni, Prato Sesia, Italy, assignor to Cavanna S.p.A., Italy

Filed Jun. 19, 1989, Ser. No. 367,876
Claims priority, application Italy, Dec. 30, 1988, 68175 A/88
Int. Cl.[5] B65G *47/26*
U.S. Cl. 198—460 **16 Claims**



1. A method for regulating the advance of products to be packaged from a supply station towards a handling station which is situated downstream of the supply station in the direction of flow of the products and which stops for certain periods of time, motor-driven conveyor means being interposed between the supply station and the handling station for collecting products which accumulate during the periods of stoppage of the handling station, wherein the method includes the steps of:

dividing the motor-driven conveyor means into a plurality of sections in series, with the furthest downstream section adjacent the handling station,

monitoring the flow of products on the sections so as to identify, for each section, at least one normal operating condition and one condition in which the section is completely filled with accumulated products,

controlling movement of each of the sections when its completely filled condition is detected so that movement of each section is the same as movement of the section immediately downstream, movement of the section furthest downstream being the same as movement of the section immediately downstream, movement of the section furthest downstream being the same as movement of the handling station,

causing the handling station to operate at a given speed when the sections are all operating normally,

detecting a condition in which at least some of the sections have stopped as a result of a stoppage of the handling station, and

restarting the handling station at an accumulation-take-up speed which is faster than the given speed so that all the sections which are full also move at an accumulation-take-up speed.

4,962,845

CONVEYER BELT SCRAPING APPARATUS

A. Todd Gibbs, Allentown, Pa., assignor to ASGCO Manufacturing, Inc., Allentown, Pa.

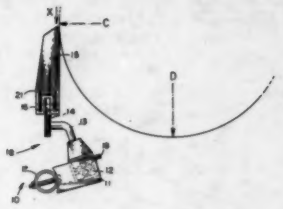
Filed Jul. 26, 1989, Ser. No. 385,627
Int. Cl.[5] B65G *45/00*
U.S. Cl. 198—499 **18 Claims**

1. An apparatus for cleaning the exposed surface of a conveyor belt on a cylindrical head pulley comprising:

(a) a transverse support member positioned in spaced relation to the surface of the conveyor belt;

(b) a plurality of blade support elements mounted on said transverse support member in an array across the belt width, each of said blade support elements including resilient means providing a point of rotation relative to said transverse support member; and

(c) a plurality of scraping blades attached to said blade support elements, each blade having a transverse scraping edge defined between an end surface of the blade and a side surface which faces the conveyor belt, said side surface being substantially planar and extending substantially



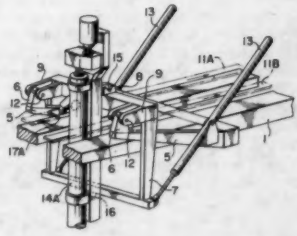
tangential to and resiliently biased radially inward into engagement with the belt on the cylindrical surface of the pulley, wherein each of said points of rotation is positioned inward towards the pulley relative to the planar surface of its associated scraping blade, to force said blade to pivot away from said belt surface upon impact by an object moving with the belt into engagement with the blade against said scraping edge.

4,962,846

UNLOADER

Takeyoshi Nakao, and Yoshio Kada, both of Niihama, Japan, assignors to Sumitomo Heavy Industries. Ltd., Tokyo, Japan

Continuation of Ser. No. 151,661, Feb. 2, 1988, abandoned. This application Jul. 17, 1989, Ser. No. 382,074
Claims priority, application Japan, Mar. 26, 1987, 62-44631; Mar. 26, 1987, 62-44632
Int. Cl.[5] B65G *67/60*
U.S. Cl. 198—602 **2 Claims**



1. An unloader comprising:

a boom having juxtaposed thereon at least two boom conveyors;

vertical screw conveyors, each screw conveyor having at a lower end an inlet port for receiving a bulk commodity to be conveyed and mating at an upper end portion within a chute at a head of the boom for discharging the bulk commodity into a corresponding boom conveyor, said vertical screw conveyors each being adapted to be exclusively combined with the corresponding boom conveyor, one of said vertical screw conveyors being disengageably mounted on said head of said boom at a location between said juxtaposed boom conveyors;

means for hanging at least one of said vertical screw conveyors from the head of said boom in such a manner as to allow the swinging of the vertical screw conveyor; and

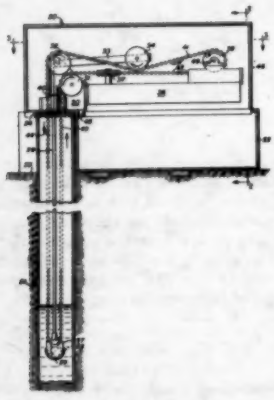
a storing stand for hanging thereon the vertical screw conveyors that are not in use, wherein said head of said boom

is capable of movement toward the vertical screw conveyors on said storing stand.

4,962,847
LIQUID LIFT

George L. Pisors, Los Gatos, and James T. Tsoka, San Jose, both of Calif., assignors to Cablelift Oil Corporation, Concord, Calif.

Continuation of Ser. No. 112,813, Oct. 23, 1987, abandoned.
This application Apr. 25, 1989, Ser. No. 344,532
Int. Cl.[5] B65G *15/00*
U.S. Cl. 198—643 12 Claims



12. A lift for liquid comprising:

a plurality of pulleys with flight receiving pockets, one pulley being located for positioning within a source of liquid and at least one pulley being located for positioning above the top of the liquid source;

an endless cable trained about the pulleys, the cable having an ascending section and a descending section; and

a pluurality of flights located at spaced intervals along the cable for maintaining a column of viscous liquid surrounding said ascending cable section and for transmitting motion between the pulleys and the cable, each of said flights are formed by two half-sections mounted together about the cable in direct gripping relationship therewith, the length of cable supported between two half-sections of a flight is less than the flight length along the cable to minimize the restriction of the flight on the flexibility of the cable.

4,962,848
RECIPROCATING FLOOR CONVEYOR

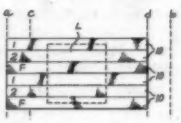
Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Filed Jan. 16, 1990, Ser. No. 464,938
Int. Cl.[5] B65G *25/00*
U.S. Cl. 198—750 4 Claims

1. A reciprocating floor conveyor for moving a load, comprising a plurality of groups of elongated floor members mounted adjacent each other in a single plane, characterized by each said group comprising:

two movable floor members mounted adjacent each other for longitudinal movement in unison, between start and advanced positions, and independent movement sequentially from the advanced position back to the start position, and a third fixed-in-position floor member,

whereby, when the movable floor members are moved in unison between the start and advanced positions, they present a larger area in contact with the load than the fixed-in-position floor members, and when each movable floor member is returning from the advanced position to the start position, there is always a movable floor member which is not moving, and it and the fixed-in-position floor

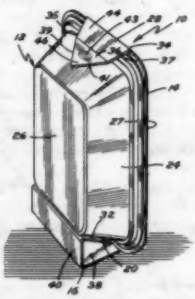


member will together present a larger area in contact with the load than the movable floor member which is retracting from its advanced position to its start position.

4,962,849
FOOD CONTAINER WITH LID CLOSURE HAVING A STAND FEATURE

David S. Anderson, Brooklyn Park, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Oct. 6, 1989, Ser. No. 418,425
Int. Cl.[5] B65D *5/52*
U.S. Cl. 206—45.24 27 Claims



1. A container for a packaged item adapted to stand on its sidewall in a vertically aligned position on a shelf thereby allowing presentation of a major face to the consumer without requiring an outer carton and which subsequent to opening can be partially reclosed, comprising:

A. a tray for supporting the item having a rear major surface, an open major face opposite the rear major surface and a continuous sidewall having a top edge

B. a lid closure fabricated from a single flexible material piece having

a lid panel having an outside and inside major surface and upper and lower ends overlaying the open face and extending over the top edge surface,

means for supporting the tray in said vertically aligned position, said means being integrally connected to said lid panel proximate the sidewall, said lid panel being hingedly connected to the support means,

adhesive means for releasably attaching said lid panel to the top edge surface of the tray,

a means for controllably opening the lid closure,

wherein the means for supporting the tray, the plurality of panels includes

a base panel hingedly connected to the lid panel along a first common transverse fold line and wherein the base panel is in a plane perpendicular to the plane of the lid panel,

a rear panel hingedly connected to the base panel along a second common transverse fold line and wherein the rear panel is in the plane as the tray rear face, and

at least one support panel hingedly connected to the rear panel along a third common fold line, said support panel having at least a portion being adhesively secured to the outside of the tray sidewall.

4,962,850

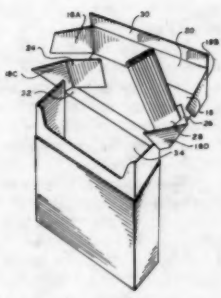
CIGARETTE BOX WITH INTERIOR MATCHES

Mark Monto, 1 Blueberry Bend, West Orange, N.J. 07052

Filed Feb. 28, 1990, Ser. No. 486,297

Int. Cl.[5] B65D *85/10*

U.S. Cl. 206—92 **8 Claims**



1. A cigarette box having a flip-top lid, said lid having a top and at least three sides, said lid having a pair of spaced flaps swingably attached at opposing positions inside said lid, said flaps being swingable into an interior position parallel to said top, said lid comprising:

a plurality of matches projecting from at least one of said flaps and swingable into a position parallel to said top.

4,962,851

DISPENSER

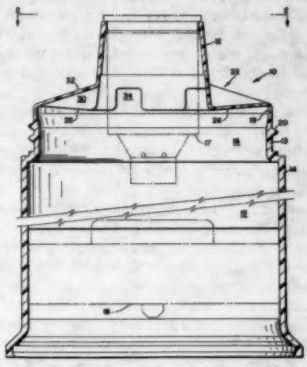
Alfred Von Schuckmann, Kevelaer, Fed. Rep. of Germany, and James C. McKinney, Tega City, S.C., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed May 8, 1989, Ser. No. 349,409

Int. Cl.[5] B65D *37/00*

U.S. Cl. 222—209 **16 Claims**

7. A pump diaphragm for use in a dispenser comprising peripheral skirt means, central discharge barrel means, a plurality of angularly spaced, raised hollow ribs and valleys therebetween extending radially between said skirt means and said



barrel means, all of said valleys inclining downwardly from said skirt means to said barrel means.

4,962,852

DOUBLE-CHAMBERED CONTAINER FOR LIQUIDS

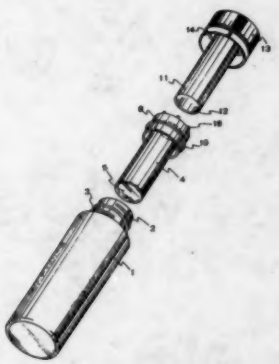
Peitro Affaitati, Rome; Rosario Affaitati, Salerno; Luigi Sannino, Portici, and Bruno Sannino, Caserta, all of Italy, assignors to IMS-International Medical Service S.r.l., Rome, Italy

Filed Jan. 2, 1990, Ser. No. 457,478

Claims priority, application European Pat. Off., Jan. 2, 1989, 89830001.7

Int. Cl.[5] B65D *81/32, 25/08*

U.S. Cl. 206—222 **3 Claims**



1. Double-chambered container in plastic material for liquids formed by a container (1) equipped in the upper part with a neck (2) open, bearing a first thread (3), with a shoulder (18) and in the lower part with a closed bottom,

characterized by the fact of comprising:

(a) a tubular sealing member (4) having:

a disposable lower removable bottom (5), a flaring at the open upper end (6), a flange (7) stretching outwards from said flaring, a cylindrical skirt (8) stretching downwards from said flange, a second thread (9) on the internal face of said cylindrical skirt, engageable with said first thread, to take the edge of said neck in contact engagement with the lower surface of

said flange and a first circular bead (10) on the external face of said cylindrical skirt; and

(b) an open bottomed tubular cartridge (11), insertable in fluid-tight engagement inside said sealing member, said cartridge having a lower end open (12), an upper cap (13) a second circular bead (15) on the internal surface of said cap, and a safety ring (14) removably connected in the lower part of said cap, said cartridge being able to occupy

a first storing position when said sealing member is threaded on said container through said thread, wherein it is able to receive in fluid-tight engagement said cartridge so that a hermetically closed chamber (19) is formed, defined by said cartridge and by said bottom of the sealing member, said member and said cartridge being locked by the unidirectional engagement of said first and said second bead and by the stop of said ring against the shoulder of the container, and

a second position of use after having torn the safety ring and pressed on the cap, wherein the open end of the cartridge removes said bottom from the sealing member so that the liquids present in said container and said hermetically closed chamber are connected.

4,962,853

MULTI-COMPARTMENT CONTAINER FOR POURABLE SUBSTANCES

Bodo Hildebrandt, Riedstadt, Fed. Rep. of Germany, assignor to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

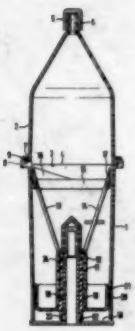
PCT No. PCT/EP88/00344, § 371 Date Jan. 20, 1989, § 102(e) Date Jan. 20, 1989, PCT Pub. No. WO88/09297, PCT Pub. Date Dec. 1, 1988

PCT Filed Apr. 22, 1988, Ser. No. 327,919

Claims priority, application Fed. Rep. of Germany, May 20, 1987, 8707230

Int. Cl.[5] B65D *23/04*

U.S. Cl. 206—222 **12 Claims**



1. A multiple compartment container for pourable substances, particularly liquids, comprising first and second container portions each having an interior space; at least one foil for separating said first and second container portions; means for severing said foil; a spindle located in said first container portion for rotatably supporting said severing means; and rotatable activating means connected with said severing means for joint rotation therewith, said spindle comprising an axially extending bore, and said activating means comprising a pivot received in said axially extending bore and having an end facing the interior space of said first container portion, said end being formed as a driver for said severing means, said axially extending bore comprising a circumferentially extending groove, and said pivot comprising a circumferentially extending flange cooperating with said circumferentially extending groove to form an axial protection for said activating means.

4,962,854

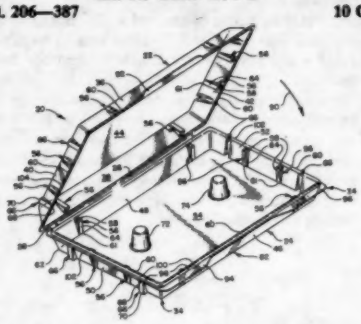
VIDEOCASSETTE CASE

Geogre M. Ricci, 1402 187th Ave. NE., Bellevue, Wash. 98008

Filed Apr. 20, 1989, Ser. No. 341,153

Int. Cl.[5] B65D *85/672*

U.S. Cl. 206—387 **10 Claims**



1. A videocassette case fabricated in its entirety and as a single component from a non-rigid, thin gauge synthetic polymer and having a traylike upper section and a traylike lower section; each of said sections having first and second side walls and first and second end walls; said lower section having a flat bottom wall; said upper section having a flat upper wall; said upper and lower sections being dimensioned to confine a videocassette between the apposite side and end walls of said upper and lower sections; there being a unitary living hinge extending along and between a said side wall of said upper section and a said side wall of said lower section, cooperating means on the other side wall of said upper section and the other side wall of said lower section which can be engaged to latch said upper and lower sections together, and hollow, frustoconical bosses which are formed unitarily with and extend upwardly from said bottom wall of said lower section so as to have open lower ends at said bottom wall and which are engageable with the hubs of a videocassette stored in said case to prevent said hubs from rotating; and at least said upper section being sufficiently transparent to permit information on a cassette stored therein to be viewed through said upper section.

9. A videocassette case fabricated in its entirety and as a single component from a non-rigid, thin gauge synthetic polymer and having a traylike upper section and a traylike lower section; each said section having first and second side walls and first and second end walls; said lower section having a flat bottom wall; said upper section having a flat upper wall; said upper and lower sections being dimensioned to confine a videocassette between the apposite side and end walls of said upper and lower sections; there being a unitary living hinge extending along and between a said side wall of said upper section and a said side wall of said lower section, cooperating means on the other side wall of said upper seciton and the other side wall of said lower section which can be engaged to latch said upper and lower sections together, a plurality of stiffeners formed unitarily with, and at spaced intervals along, said side and end walls of said lower section and protruding into said case so as to form hollows on the exterior of said lower section of said case, each said stiffener on said lower section having a rectangular section and a wedge-shaped profile with an apex at said bottom wall of said lower section and a base adjacent to the free edge of the side or end wall in which it is formed, a plurality of stiffeners formed unitarily with, and at spaced intervals along, said side and end walls of said upper section and protruding into said case so as to form hollows on the exterior of said upper section of said case, each said stiffener on said upper section having a rectangular section and a wedge-shaped profile with an apex at said upper wall of said upper section and a base adjacent to the free edge of the side or end wall in which it is formed, thereby facilitating stacking of plural ones of said case, each said case being stacked in an open

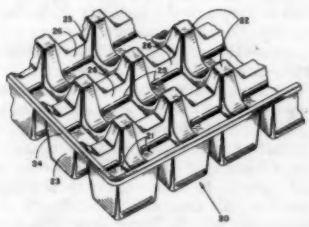
position so that said upper wall and lower wall thereof are substantially horizontal, and so that said inwardly protruding stiffeners on a said upper section of a first said case are received in said hollows on the exterior of a said upper section of a second said case and said upper wall of said first case is adjacent said upper wall of said second case, and said inwardly protruding stiffeners on a said lower section of said first case are received in said hollows on the exterior of a said lower section of said second case and said bottom wall of said first case is adjacent said bottom wall of said second case; said stiffeners in said lower an upper sections of said case being dimensioned to fit snugly against the sides and ends of a video-cassette stored in said case and thereby restrain said videocassette against longitudinal and lateral movements in said case.

4,962,855

SYSTEM FOR LOADING THIN-WALLED PLASTIC FLOWER POTS ONTO A LOADING TRAY

Marlon E. Holmquist, St. Paul, Minn., assignor to T. O. Plastics, Inc., Minneapolis, Minn.

Filed May 25, 1989, Ser. No. 357,032
Int. Cl.[5] B65D *1/34, 85/50*
U.S. Cl. 206—423 **7 Claims**



1. In a loading tray for a plurality of stacks of upside-down, thin-walled, plastic flower pots arranged in preset spaced rows and columns, said tray made of thin, somewhat resilient, relatively stiff plastic and having a plurality of cavities spaced in the same arrangement as the stacked flower pots, each of the cavities having an open top and inwardly downward tapering side walls, the improvement comprising:

an inward extending elongated rib in a sidewall of each cavity near but spaced upward from the cavity bottom and running lengthwise parallel to the cavity bottom for grasping in each cavity a single flower pot from the stacks of flower pots when the tray is placed with the open top of the cavities over the stacks of upside-down flower pots and pushed gently onto the stacks and then lifted off the stacks.

4,962,856

PACKAGED PHARMACEUTICAL PRODUCT

Douglas V. Carter, Lenoir, N.C., assignor to Entravision, Inc., Lenoir, N.C.

Division of Ser. No. 273,605, Nov. 21, 1988, which is a continuation of Ser. No. 137,436, Dec. 23, 1987, Pat. No. 4,805,377. This application Mar. 23, 1990, Ser. No. 488,259
Int. Cl.[5] B65D *65/38*
U.S. Cl. 206—439 **9 Claims**

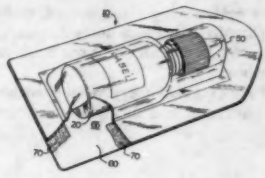
1. A sterile pharmaceutical package comprising:

(a) a translucent, resilient polymeric bottle formed of a material capable of withstanding a steam-sterilization temperature of 121° C. without vapor leakage through the walls thereof;

(b) a cap and means for securing said cap to the open top of said bottle;

(c) a washer formed of a non-toxic resilient material positioned between the inner surface of the top wall of said cap and the rim of said bottle, said washer serving to absorb pressures developed by expansion of said bottle and prevent deformation of said cap during steam-sterilization thus eliminating leakage therebetween;

(d) a blister pack formed of a prescribed polymeric material suitable for use in a steam-sterilization procedure without



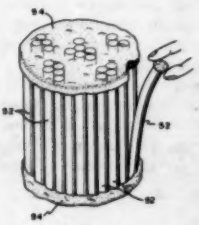
melting, a closure lid placed along the open side of said blister pack and formed from a non-woven textile material having the characteristics of being steam-permeable, said closure lid being sealed to said polymeric material around the open side thereof and capable of remaining sealed during a steam-sterilization procedure.

4,962,857

SWARM LURE PACKAGE

John Q. Adams, 1206 Foxcroft Rd., Richmond, Va. 23229

Filed Dec. 6, 1989, Ser. No. 446,597
Int. Cl.[5] B65D *85/08*
U.S. Cl. 206—443 **7 Claims**



1. A swarm lure package comprising a plurality of individual swarm lure units, said units including swarm attracting material being contained therein and a common end pack material closing the ends of each of the said individual swarm lure units forming an integral package thereby, said end pack material permitting removal of individual ones of said units while maintaining the integrity of the package of the remaining units.

4,962,858

CLEANING SLUICE BOXES

John C. Newman, 811 Evergreen, Longview, Tex. 75604, and Lloyd A. Molby, Longview, Tex., assignors to John C. Newman, Longview, Tex.

Continuation-in-part of Ser. No. 251,748, Oct. 3, 1988, abandoned. This application Jul. 14, 1989, Ser. No. 380,210
Int. Cl.[5] B03B *7/00*
U.S. Cl. 209—44 **2 Claims**

1. Apparatus facilitating recovery of a heavy metal from ore material, the apparatus including:

a. an input hopper for receiving ore material containing a more dense heavy metal concentrate and a less dense material including dirt and sand

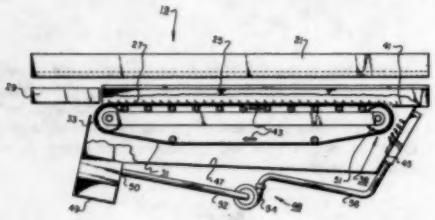
b. wash means for washing said ore material, including a water sprayer for spraying water on said ore material and effecting downward movement of said less dense material of said ore material and said more dense heavy metal

concentrate of said ore material; the improvement comprising

c. a sluice box including a vibrating screen and a rock tailings chute, said screen serving to vibrate the washed ore material to separate any oversized material, the remaining material passing through the screen to the bottom of said sluice box;

d. an endless belt moving about rollers; said endless belt having upwardly extending fibers for trapping thereon said heavy metal concentrate passed from the bottom of said sluice box;

e. means for allowing said heavy metal concentrate to move from the bottom of said sluice box for forcing said less



dense material to pass thereover and allowing said more dense heavy metal concentrate to fall onto said belt;

f. high pressure spray means including high pressure nozzles for spraying high pressure water on said endless belt to wash therefrom said heavy metal concentrate;

g. a heavy metal concentrate collecting chute means disposed immediately beneath said belt and said high pressure nozzles for collecting heavy metal concentrate for further processing; and

h. recycle means for recycling water and small particles of heavy metal concentrate to minimize loss thereof; whereby said belt is cleaned continuously by said high pressure water spray and problems with said apparatus being out of service for cleaning are alleviated.

4,962,859

LITERATURE DISPLAY BOX AND FOLDABLE BLANK FOR FORMING SAME

Danny J. Kump, Mayfield, Ohio, assignor to Gerald Conway & Company, Cleveland, Ohio

Filed Apr. 10, 1989, Ser. No. 335,861
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—50 **25 Claims**

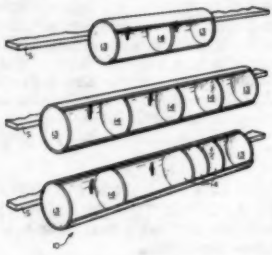
1. A literature display box comprising a bottom wall, a front wall hinged to the front edge of said bottom wall, a back wall hinged to the back edge of said bottom wall, first side wall panels hinged to each side of said back wall and secured to the respective side edge of said bottom wall, and second side wall panels hinged to each side of said front wall and secured to the respective side edge of said bottom wall, said second side wall panels overlapping the respective first side wall panels.

4,962,860

MERCHANDISING DISPLAY UNIT

Paul F. Lehmann, 1855 N. Custer Rd., Monroe, Mich. 48161

Filed Oct. 5, 1989, Ser. No. 417,475
Int. Cl.[5] A47F *5/08*
U.S. Cl. 211—88 **4 Claims**



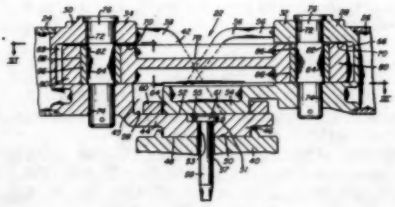
1. A merchandising display unit, comprising, in combination, an elongate horizontal channel of uniform interior diameter including a rigid arcuate wall extending at least 180° around a horizontal axis to form a partial enclosure with a bottom and opposed sides and an open top extending between the opposed horizontal edges of said sides, a fixed transverse barrier on each end of said channel, and at least one transverse divider intermediate said end barriers, each such divider comprising a rigid disc extending transversely across said channel and having an arcuate periphery at least co-extensive with said arcuate channel wall, said disc having an effective diameter slightly larger than the interior diameter of such channel whereby, when said disc is placed transversely within said channel in any desired horizontal position, said channel will be slightly strained to receive and retain said disc and the opposed sides of said channel will exert sufficient force upon said disc to maintain its desired position.

4,962,861

ARTICULATED CONNECTOR

Donald Wiebe, Sewickley, Pa., assignor to A. Stucki Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 177,048, Apr. 4, 1988, abandoned. This application May 1, 1989, Ser. No. 348,173
Int. Cl.[5] B61D *15/00*
U.S. Cl. 213—75 R **17 Claims**



1. In a rail car connecting apparatus that is operable to transmit buff and draft loads between a pair of adjacent rail car platform ends that are supported for relative movement with respect to each other and for movement thereof along a railway track, a connector assembly, comprising:

a first connector portion adapted to be affixed to one of such a pair of platform ends;

a second connector portion adapted to be affixed to the other of such a pair of platform ends;

said first and second connector portions including mutually

engageable bearing means which are cooperable to provide support for one of said first and second connector portions by the other and to permit relative pivotal movement of said first and second connector portions with respect to each other about given axes of rotation;

an elongated draft appliance extending longitudinally of said first and second connector portions;

said first and second connector portions including respective longitudinally spaced connection means connecting the respective said connector portions to said draft appliance; and said connection means being disposed with respect to said mutually engageable bearing means such that at least some of said given axes of rotation move longitudinally with respect to at least one of said connection means in response to at least some modes of such relative pivotal movement between said first and second connector portions.

4,962,862

THERMOPLASTIC CONTAINER HAVING END WALL BUTT-WELDED TO BODY

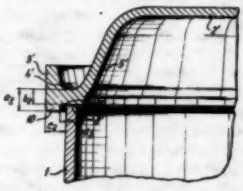
Edward J. Farrington, Vinkeveen, and Gerrit J. Van Keimpema, Woerden, both of Netherlands, assignors to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Filed May 18, 1989, Ser. No. 353,458

Claims priority, application Netherlands, May 27, 1988, 8801370

Int. Cl.[5] B65D *8/04*

U.S. Cl. 220—613 **2 Claims**



1. Container comprising a circular cylindrical vessel body made of thermoplastic material having a predetermined wall thickness and a longitudinal axis, and a circular end wall closing the upper end of said body, said end wall having a predetermined wall thickness and having an integral axially and radially outwardly-facing flange having an external diameter greater than the external diameter of said vessel body the underside of which forms a gripping edge, said vessel body and said end wall being heated-tool butt-welded to each other at confronting circular weld faces lying in a plane disposed at right angles to the axis of said vessel body, the weld face of the vessel body having a radial width which prior to welding is substantially equal to said predetermined wall thickness, and the weld face of the end wall having a width greater than the wall thickness of the vessel body and being defined by an axially-extending annular-shaped surface formed in the underside of said flange having inner and outer diameters respectively smaller and larger than the inner and outer diameters of said vessel body and being surrounded by an axially extending edge which bounds the flange on the outside and extends axially a predetermined distance beyond the plane of the weld face so as to surround and conceal the weld, said end wall having an axial thickness in the region of the weld face equal to or slightly greater than the radial width of said axially extending edge and slightly greater than the wall thickness of the portion of the end wall which is surrounded by said flange.

4,962,863

BLOW MOLDED BARREL OF THERMOPLASTIC SYNTHETIC RESIN MATERIAL

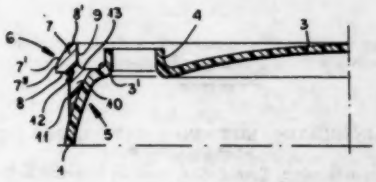
Bruno Wendling, Drulingen, and Georges Roser, Weislingen, both of France, assignors to Sotralentz S.A., Drulingen, France

Filed Aug. 1, 1989, Ser. No. 388,828

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1989, 3906831

Int. Cl.[5] B65D *7/42*

U.S. Cl. 220—69 **5 Claims**



1. A barrel, comprising:

a barrel body formed in one piece from a thermoplastic synthetic resin and having a top wall closing an upper end of the barrel, a bottom wall closing a lower end of the barrel, a peripheral wall bridging said top and bottom walls and enclosing an interior of the barrel, and a radiused transition between said peripheral wall and said top wall; and

a transport and reinforcing ring fixed to said body at said radiused transition, said ring being composed of an elastically deformable thermoplastic synthetic resin and being formed with:

an upper and outer portion of generally trapezoidal cross section bounded by a bottom surface turned downwardly and forming a horizontal support shoulder and a vertical cylindrical inner surface turned toward a center of the barrel and said top wall,

a weld flange extending downwardly from said upper portion along said radiused transition and welded thereto, said weld flange being bounded externally by a vertical outer surface, and

an intermediate elastically deformable piece between said inner and outer surface and elastically connecting said upper and outer portion unitarily with said flange.

4,962,864

TAMPER-EVIDENT AEROSOL CAP

Eugene R. Appel, Florissant; Michael A. Beiser, and James P. McBroom, both of St. Louis, all of Mo., assignors to Clayton Corporation, St. Louis, Mo.

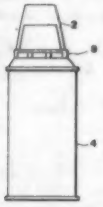
Continuation-in-part of Ser. No. 187,013, Apr. 27, 1988, abandoned. This application Jan. 23, 1989, Ser. No. 299,124

Int. Cl.[5] B65D *17/34*

U.S. Cl. 220—270 **17 Claims**

1. A tamper-evident cap comprising a top cover member and a skirt containing a locking lug member, wherein a portion of said skirt comprises a removable tear away section and said

locking lug member includes a discontinuous portion substantially diametrically opposed to said tear away section for permitting mounting of said cap on a container and removal by inwardly squeezing said top cover member.



4,962,865

INSULATING BOX AND A METHOD FOR ITS MANUFACTURE

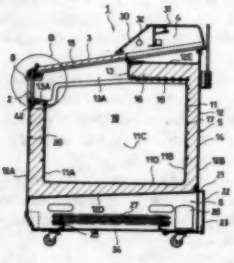
Zenichi Kakinuma, Tochigi-Ken; Masashi Yamamoto, Gunma-Ken; Katsumi Nakoda, Tochigi-Ken; Yasao Noda, Saitama; Michihisa Hama; Masahiro Nakamura, both of Gunma, all of Japan

Filed Feb. 13, 1990, Ser. No. 479,378

Claims priority, application Japan, Feb. 15, 1989, 1-36730; Mar. 1, 1989, 1-50495; May 9, 1989, 1-115608

Int. Cl.[5] B29D *27/04*; B65D *25/14*

U.S. Cl. 220—444 **12 Claims**



1. An insulating box for a low-temperature show case having an upper opening, comprising:

an inner box and an outer box spaced apart from each other;

a frame covering, and extending between, the edge portions of said inner and outer boxes to enclose the space between them;

a recess formed in the upper front end of said insulating box;

a transparent panel inserted into groove portion formed in said frame, said frame extending along said recess;

a thermally insulating material injected and expanded in said space between said inner and outer boxes after said frame and transparent panel were secured in position.

4,962,866

NON-ATTENDED, SELF-SERVICE CUP VENDER

Paul A. Phillips, Marietta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Nov. 4, 1988, Ser. No. 267,052

Int. Cl.[5] G07F *11/00*

U.S. Cl. 221—8 **12 Claims**

1. In a beverage cup vender having

a housing and

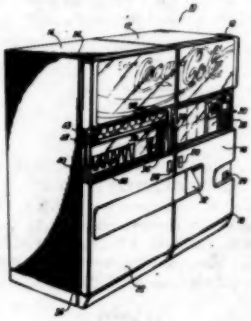
a coin mechanism in said housing for initiating the dispensing cycle; the improvement comprising:

(a) a plurality of separate consumer activated stations comprising:

(1) a cup size selection station, including means for selecting the cup size to be vended, said means providing a first output signal;

(2) a cup drop station including a vending port in a front panel of said housing;

(3) an ice dispensing station including means for dispensing an amount of ice to be determined by a consumer into a cup placed by the consumer at said ice dispensing station, said ice dispensing station being separate from and disposed adjacent to said cup drop station, said means for dispensing ice providing a second output signal;



(4) a beverage dispensing station, separate from and disposed adjacent to said ice dispense station, said beverage dispensing station including means responsive to a selection button operated by the consumer for dispensing a selected beverage;

(b) an electronic controller mounted in said housing for controlling the beverage dispensing operation of said cup vender, said controller including means, responsive to said first and second output signals, for limiting the amount of beverage dispensed by the means for dispensing a selected beverage, whereby the total volume of ice and beverage dispensed approximates the volume of the cup selected by the consumer; and

(c) means coupled to and responsive to said electronic controller for guiding the consumer to the next of said stations to be operated by the consumer.

4,962,867

AUXILIARY ARTICLE DISPENSER FOR VENDING MACHINES

Leonard A. Ficken, and Robert L. Stadler, both of St. Louis County, Mo., assignors to Unidynamics Corporation, New York, N.Y.

Filed Oct. 19, 1988, Ser. No. 259,860

Int. Cl.[5] B65G *59/00*

U.S. Cl. 221—130 **10 Claims**

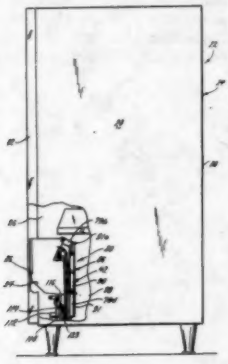
1. In a merchandise vending machine of the type comprising a cabinet, a delivery bin at the front of the cabinet, near the bottom, and means in the cabinet above the bin for dispensing merchandise to the bin, the improvement comprising:

an auxiliary article dispenser in the cabinet at the rear of the bin and below the merchandise dispensing means, the dispenser comprising a bank of at least one generally inverted-J shaped magazines for holding articles, each magazine having a generally vertically extending straight portion and a forwardly extending curved dispensing portion having an opening in the top;

means for urging articles in the magazine upwardly toward the curved dispensing portion;

means for ejecting articles one at a time from the top of the dispensing portion of the magazine, comprising an ejector member mounted for reciprocal motion generally transverse to the magazine to push an article upwardly out the opening in the top of the magazine, and

means for reciprocating the ejector member comprising a motor, an eccentric drive member, driven by the motor,



which orbits in a generally vertical plane, and a linkage connected to the eccentric drive member and the ejector so that movement of the drive member reciprocates the ejector member the linkage comprising a generally horizontal channel adapted to receive the drive member, the channel transmitting vertical movement of the drive member to the linkage while accommodating lateral movement of the drive member resulting from its orbital motion.

4,962,868

APPARATUS FOR DISPENSING A CONTROLLED DOSE OF A LIQUID FLUID

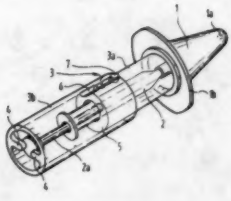
Hans-Jürgen Borchard, Berlin, Fed. Rep. of Germany, assignor to Henning Berlin GmbH, Berlin, Fed. Rep. of Germany

Filed Mar. 21, 1989, Ser. No. 326,389

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1988, 3810262

Int. Cl.[5] B67D *5/22*

U.S. Cl. 222—49 **15 Claims**



1. Apparatus for nasal administration of a controlled dose of a liquid medication through atomizing the liquid medication, comprising:

a spray head provided with a spray nozzle through which the liquid medication is delivered;

fluid-containing means including a syringe which is filled with liquid medication and has a forward portion snugly connected to said spray head and a piston slidably guided in said syringe for delivering the medication;

encasing means connected to said spray head and completely surrounding said fluid-containing means, with said piston being initially in retracted position, said encasing means including at least two telescopic tubular members slidable relative to each other between an extended position and a fully depressed position for actuating said piston; and

control means for stepwise actuation of said piston to allow delivery of a controlled dose of liquid medication into each nostril, said control means including at least one groove-pin arrangement by which said tubular members are lockable relative to each other in the extended position and in at least one intermediate position before reaching the fully depressed position.

4,962,869

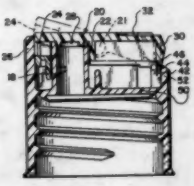
TOGGLE-ACTING DISPENSING CLOSURE WITH IMPACT RESISTANCE

Richard A. Gross, and Bruce M. Mueller, both of Crystal Lake, Ill., assignors to Sequist Closures, Crystal Lake, Ill.

Filed Apr. 11, 1989, Ser. No. 336,257

Int. Cl.[5] B67D *5/32*; B65D *47/00*

U.S. Cl. 222—153 **6 Claims**



4. A toggle-acting dispensing closure which is resistant to inadvertent actuation during shipping and handling prior to purchase comprising:

a body;

an actuator having a depending portion and defining a discharge opening and being pivotably mounted on said body for pivotal movement of the actuator on the body normally in response to a first force applied to said actuator at a first location on said actuator for movement of the actuator between a closed, non-dispensing position and an open dispensing position, said actuator defining trunnions pivotally received in recesses in said body; and

upstanding deformable resistance means on said body and confronting said depending actuator portion, said resistance means defining a notch to receive said depending portion of said actuator, said upstanding resistance means being positioned oppositely from said discharge opening, said resistance means preventing movement of said depending actuator portion downwardly in said notch in response to the application of said first force at said first location, but permitting movement of said actuator downwardly in said notch in response to a substantially higher second force at said first location;

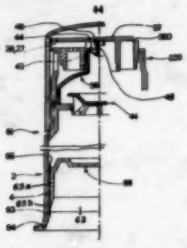
whereby when said second force is applied at said first location, said upstanding resistance means will be permanently deformed, and thereafter said actuator will move to said open dispensing position in response to the application of said first force.

4,962,870

DISTRIBUTOR FOR PASTY PRODUCTS WITH A DEFORMABLE PUMPING MEMBER AND A FLEXIBLE DISK EXPULSION VALVE CONNECTED TO THE PUMP ACTUATOR BY A CENTRAL BEARING LINK

Bernard Schneider, Sainte Menehould, France, assignor to Cebal, Clichy, France

Filed Sep. 22, 1988, Ser. No. 247,502
Claims priority, application France, Sep. 25, 1987, 87 13927
Int. Cl.[5] B65D *37/00*
U.S. Cl. 222—207 **15 Claims**



1. A pasty product distributor comprising:

a tubular body, a distribution head fixed to the tubular body, and a piston tightly slidable in the tubular body for movement toward said distribution head; said distribution head including:

pumping means for the pasty product, in addition to said sliding piston, incorporating a deformable tubular pumping member, a distribution duct extending therefrom, an expulsion valve between said pumping member and said distribution duct for expelling the pasty product from said pumping member into said distribution duct and an actuator acting on said pumping member;

said pumping member having a base fixed with respect to the tubular body, a deformable part above said base and an upper tube, said expulsion valve having a member defined by the upper end of said upper tube of said pumping member;

the distribution duct for the pasty product communicating with said pumping member, said upper end of the upper tube of the deformable pumping member having an annular end edge, said expulsion valve including a flexible disk, having a periphery bearing against the end edge of the tube, and said disk having a central bearing means, said bearing means being linked with the actuator, wherein said flexible disk and said end edge of the tube respectively form a flap and a seat of said expulsion valve.

4,962,871

APPLICATOR UTILIZING HIGH SPEED NON-CONTACT EXTRUSION VALVE

Michael A. Reeves, Cincinnati, Ohio, assignor to Valco Cincinnati, Inc., Cincinnati, Ohio

Filed Jul. 24, 1989, Ser. No. 383,334
Int. Cl.[5] B67D *3/00*
U.S. Cl. 222—504 **26 Claims**

1. An apparatus for applying fluid to a product, comprising:

(A) a housing base;

(B) a high speed non-contact extrusion valve positioned within said housing base for allowing fluid flow therethrough, said valve further comprising:

(1) an inlet;

(2) a generally cylindrical fluid body defining a chamber therein;

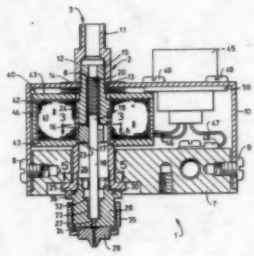
(3) a static pole positioned between and secured to both said inlet and said fluid body, said static pole having a hole therethrough which is aligned with said inlet to permit fluid flow;

(4) a plunger assembly adjacent said static pole and slidably retained within said fluid body chamber, said plunger assembly including:

(a) a dynamic pole, said dynamic pole having slots formed in the top and sides thereof to permit fluid flow; and

(b) a needle connected to said dynamic pole;

(5) a spring positioned within the hole in said static pole and braced against an annular flange therein, said spring also being in contact with said plunger assembly such that said plunger assembly is biased away from said static pole;



(6) an outlet connected to said fluid body; wherein said plunger assembly is positioned such that said needle abuts said outlet to interrupt fluid flow; and

(7) a coil for generating an electromagnetic field on said static pole and said dynamic pole, wherein said electromagnetic field causes the plunger assembly to move toward said static pole by overcoming the bias of said spring and said needle is moved away from said outlet to allow fluid flow therethrough and application of fluid to a product; and

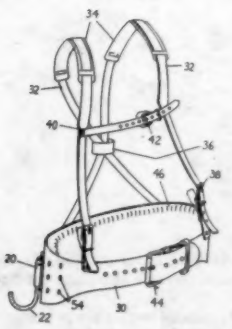
(C) means for transmitting current to said coil.

4,962,872

CONTAINER CLOSURE DEVICE

Bernard Strong, Tarzana, Calif., assignor to Pro Pak California, City of Industry, Calif.

Filed Nov. 3, 1988, Ser. No. 267,043
Int. Cl.[5] B67D *3/00*
U.S. Cl. 222—516 **17 Claims**



1. A valve comprising

(1) a body including

(a) a disk portion, and

(b) a channel portion extending axially out from said disk portion and having (i) a port in a first side of the channel

portion, (ii) a channel extending through the disk portion providing a fluid path through the disk to the port, and (iii) a sealing seat in the port;

(2) a connecting means adapted for sealably attaching the body to a fluid outlet; and

(3) a spring seal mechanism generally having a "U" shape with the channel portion wedged therein, the spring seal mechanism having a first leg with a substantially flat surface engaging the sealing seat in the port,

wherein the spring seal mechanism biases the flat surface of the fist leg into engagement with the sealing seat of the port.

4,962,873

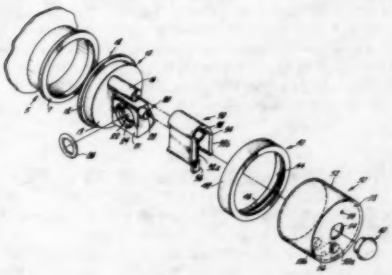
MATERIALS HANDLING DEVICE

John L. Schattel, 3106 Honey Tree La., Austin, Tex. 78746

Filed Dec. 4, 1989, Ser. No. 445,959

Int. Cl.[5] A45F *5/00*

U.S. Cl. 224—226 **2 Claims**



1. A tool for carrying rebar or other heavy circular construction material consisting of:

a hook of semicircular shape mounted to a base of sufficient size and strength wherein can be placed rebar or other heavy circular construction material,

a means of mounting said hook to the base in a manner which allows the hook to swivel,

a means of providing detents which hold the hook in a stored or operational position,

a customized belt adapted to be worn around the waist of a worker, and

said base being mounted to said belt such that said hook depends below said belt.

4,962,874

NOTEPAD HOLDER FOR AUTOMOBILES

Erik Hagglund, New Canaan, Conn., assignor to Tretten, Inc., New Canaan, Conn.

Filed Apr. 12, 1989, Ser. No. 336,889

Int. Cl.[5] B60R *7/00*

U.S. Cl. 224—277 **11 Claims**

1. A device for mounting writing material to an inner surface of a windshield of a motor vehicle, said device comprising:

a base having a top end portion, a bottom end portion, a front surface, and a rear surface,

clamp means mounted to the front surface of said base for removably retaining said writing material against said front surface of said base,

at least two separate arm portions extending upwardly from said top end portion of said base, each of said arm portions having front and rear surfaces and including a lower arm portion connected to said base and an upper arm portion connected to said lower arm portion by a flexible material for allowing pivoting of said base relative to said upper arm portions;

at least two separate mounting elements adapted to be affixed to said inner surface of said windshield of said motor

vehicle, and said rear surfaces of said upper arm portions having means thereon for removably mating with said two separate mounting elements thereby mounting said base to said inner surface of said windshield.

4,962,875

PARTS APPLYING APPARATUS

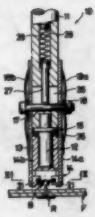
Toshiaki Sodeno, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed May 4, 1989, Ser. No. 347,013

Claims priority, application Japan, May 9, 1988, 63-61408[U]

Int. Cl.[5] A41H *37/10*

U.S. Cl. 227—149 **7 Claims**



1. A parts applying apparatus which comprises:

(a) a reciprocating ram;

(b) a punch concentrically secured to said ram and having an annular flange;

(c) a punch holder slidably accommodating said punch and having a plurality of downwardly projecting lugs adapted to releasably receive fastening parts for attachment to a fabric;

(d) a parts gripper comprising a pair of sleeves slidably fitted around said ram, each of said sleeves having a pair of upper and lower gripping jaws defining therebetween a transverse pocket for releasably receiving said parts and a vertical slit extending through said jaws for receiving said projecting lugs; and

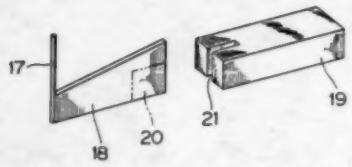
(e) an elastic member interposed between said punch holder and said annular flange.

4,962,876

METHOD OF PRODUCING A MOVABLE PART OF A WIRE-DOT PRINT HEAD

Hirokazu Andou; Tatsuhiko Shimomura, and Hiroshi Kikuchi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 318,312
Claims priority, application Japan, Mar. 14, 1988, 63-59609
Int. Cl.[5] B23K *31/00, 101/36, 20/00*
U.S. Cl. 228—193 9 Claims



1. A method of producing a movable part of a wire-dot print head comprising an armature supported by a plate spring, and a lever having a tip to which print wire is fixed, said method comprising the steps of:

forming the armature and the lever;

inserting a bond part of a base part of the lever in a bond groove provided in a tip of the armature; and

heat-treating the lever and the armature in vacuum, so that the lever and the armature are diffusion-bonded;

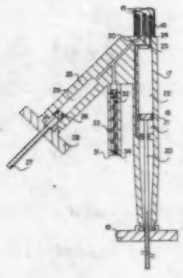
wherein said armature and said lever are formed of materials easy to diffuse into each other at the temperature of the heat treatment for the diffusion.

4,962,877

HYDRAULIC DEVICE WITH FLEXIBLE BODY FOR SURGICAL ANASTOMOSTS

Pedro L. Hervas, Paseo Santa Maria de la Cabeza 17, 28045 Madrid, Spain

Filed Aug. 30, 1989, Ser. No. 400,493
Claims priority, application Spain, Sep. 2, 1988, 8802719
Int. Cl.[5] A61B *17/00*
U.S. Cl. 227—179 11 Claims



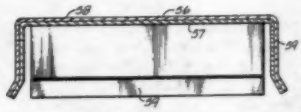
1. Hydraulic device with flexible body for surgical anastomosis, comprising a suturing and cutting head equipped to receive metal staples and a cylindrical blade, by means of which, driven by hydraulic fluid, the tissue is brought into close contact, sutured and the superfluous tissue cut off; a hydraulically driven control mechanism for the operation of said head; an intermediate body linking the head and control mechanism, including flexible hydraulic fluid tubes; the hydraulic device being hydraulically operated without spring means located in the suturing and cutting head or intermediate body, and said intermediate body, made up of tubes, being sufficiently flexible to enable it to bend in order to facilitate the positioning of the head itself.

4,962,878

DESOLDERING AID

George M. Kent, Sierra Madre, Calif., assignor to Plato Products, Inc., Glendora, Calif.

Continuation-in-part of Ser. No. 07/15,881, Feb. 18, 1987, Pat. No. 4,858,820. This application Aug. 31, 1989, Ser. No. 401,176
Int. Cl.[5] B23K *3/00, 3/02*
U.S. Cl. 228—47 21 Claims



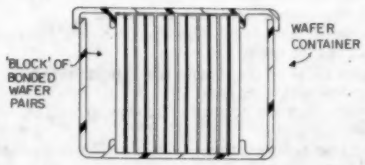
1. A desoldering aid for a standard size circuit component having electrical leads protruding from sides of the component comprising a heat deformable metal cap with a cooler state having sides further apart than the outside distance between electrical leads on the component and a warmer state having sides closer together than the outside distance between electrical leads on the component.

4,962,879

METHOD FOR BUBBLE-FREE BONDING OF SILICON WAFERS

Ulrich M. Goesele, and Volker Lehmann, both of Durham, N.C., assignors to Duke University, Durham, N.C.

Continuation-in-part of Ser. No. 286,460, Dec. 19, 1989, Pat. No. 4,883,215. This application Sep. 25, 1989, Ser. No. 411,865
The portion of the term of this patent subsequent to Nov. 28, 2006, has been disclaimed.
Int. Cl.[5] H01L *21/30*
U.S. Cl. 228—116 38 Claims



1. A method for bonding at least two wafers and storing the bonded wafers in a wafer container wherein said at least two wafers includes at least one first wafer comprising silicon and at least one second wafer comprising either silicon or glass wherein each of said wafers has at least one mirror-polished surface, including the steps of:

positioning said first and second wafers in closely spaced-apart and parallel relationship to each other and with each of said wafers having a mirror-polished surface opposing a mirror-polished surface of the other wafer;

introducing a cleansing solution onto the opposing mirror-polished surfaces of said first and second wafers;

flushing said cleansing solution from said mirror-polished surfaces of said first and second wafers;

drying said mirror-polished surfaces of said first and second wafers;

moving said first and second wafers together so that contact occurs between said opposing mirror-polished surfaces of said first and second wafers; and

placing a plurality of said bonded first and second wafers into a wafer shipping and storage container.

4,962,880

METHOD OF FORMING A HEAT EXCHANGER WITH COMPONENTS COMPRISING AN ALUMINUM ALLOY CONTAINING REDUCED AMOUNTS OF MAGNESIUM

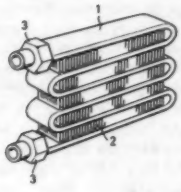
Ichiro Iwai, Tochigiken; Shigekazu Nagai, Osaka, and Tatsuo Otsuka, Tochigiken, all of Japan, assignors to Showa Aluminum Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 311,162, Feb. 15, 1989, abandoned, and a continuation-in-part of Ser. No. 101,583, Sep. 28, 1987, abandoned. This application Apr. 3, 1990, Ser. No. 504,040

Claims priority, application Japan, Sep. 30, 1986, 61-234097

Int. Cl.[5] B23K *1/19, 101/14, 103/10*

U.S. Cl. 228—183 **9 Claims**



1. A method for fabricating a heat exchanger, which comprises:

providing components including tubular elements, fins and joint members, said joint members being made of aluminum-based alloy consisting essentially of 0.3 to 0.8% Mg, 5.1 to 7.0% Zn, and one or more of 0.05 to 0.30% Zr, 0.05 to 0.30% Mn, 0.05 to 0.30% Cr. 0.05 to 0.30% Cu, and the balance being aluminum and unavoidable impurities; brazing said components to form a heat exchanger with a flux of fluoride complexes in a furnace filled with a non--oxidizing atmosphere.

4,962,881

FLOW PASSAGE COUPLING UNIT

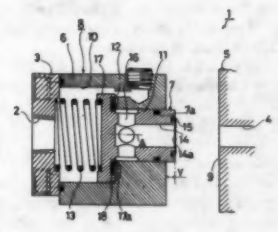
Noboru Otsuki, Akashi; Toshihiko Oonishi, Kakogawa; Katsumi Tomioka, Kobe, and Kozo Miura, Hiroshima, all of Japan, assignors to Nippon Air Brake K.K., Kobe and Hirotec Corporation, Hiroshima, both of, Japan

Continuation-in-part of Ser. No. 319,339, Mar. 6, 1989, abandoned. This application Apr. 3, 1990, Ser. No. 503,783

Claims priority, application Japan, Mar. 28, 1988, 63-41614[U]

Int. Cl.[5] F16L *37/28*

U.S. Cl. 251—149.7 **6 Claims**



1. A flow passage coupling unit for coupling a first passage of a first member and a second passage of a second member, which comprises:

a body secured to said first member and having a large bore communicating with said first passage, a small bore terminating at a coupling opening, and a valve seat formed at a shoulder portion between said large and small bores;

a sliding valve having a cylindrical sliding surface which slidably fits in said small bore and has an axial passage terminating at a coupling opening, a valve head integral with said cylindrical sliding surface and movable within said large bore, and a through-hole provided through said cylindrical sliding surface adjacent said valve head, said sliding valve having a front end opposite to said valve head projecting from a front end of said cylindrical body by a predetermined distance at a time of non-connection;

spring means provided within said large bore for biasing said valve head against said valve seat so that communication between said large bore and said axial passage is normally cut off;

an abutment surface of said valve head made in a plane which is perpendicular to an axis of said sliding valve; and

said sliding valve is provided with a circumferential groove on a sliding surface thereof over said through-hole, whereby a distance traveled by said sliding valve to provide a desired area of opening space between said valve head and said valve seat is minimized.

4,962,882

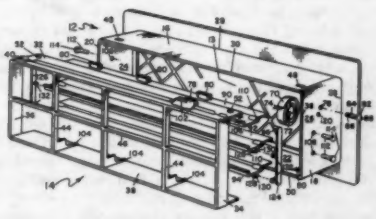
VENTILATOR

Paul M. Sarazen, Jr., 214 Fairview Dr., and Dennis A. Beam, Jr., 410 Westfield Dr., both of Shelby, N.C. 28150

Filed Nov. 27, 1989, Ser. No. 443,215

Int. Cl.[5] F24F *13/15*

U.S. Cl. 236—49.5 **20 Claims**



20. A temperature actuating ventilator, comprising:

(a) a housing defining an air passageway therethrough, said housing integrally defining a top, a first sidewall, a bottom, and a second sidewall, said bottom being disposed opposite said top, said first sidewall being connected between a first end of said top and a first end of said bottom, said second sidewall being connected between a second end of said top and a second end of said bottom, said housing and each of said top, bottom, and sidewalls further defining a front edge and a rear edge opposite said front edge;

(b) said top defining a pair of top tab openings disposed closer to said rear edge than to said front edge, one of said top tab openings disposed closer to said first sidewall than to said second sidewall, and said other of said top tab openings disposed closer to said second sidewall than to said first sidewall;

(c) said bottom defining a pair of bottom tab openings disposed closer to said rear edge than to said front edge, one of said bottom tab openings disposed closer to said first sidewall than to said second sidewall, and said other of said bottom tab openings disposed closer t said second sidewall than to said first sidewall;

(d) each of said sidewalls having an interior surface facing towards said opposite sidewall and an exterior surface facing away from said opposite sidewall;

(e) said first sidewall defining at least one louver post hole therethrough;

(f) said second sidewall defining at least two louver post holes, one of said two louver post holes being disposed closer to said top than to said bottom, the other of said two louver post holes being disposed closer to said bottom than to said top, one of said two louver post holes being disposed in registry with said at least one louver post hole in said first sidewall;

(g) said second sidewall having an attachment opening configured to non-rotatably receive a nut;

(h) a nut nonrotatably disposed in said attachment opening, said nut having a threaded opening therethrough;

(i) a pair of clip holders disposed on the exterior surface of said top and spaced apart from each other near said front edge, each said clip holder having an upper wall with a slot defined therethrough and extending along most of the length thereof and near the center thereof;

(j) a spring box disposed on said interior surface of said first sidewall, said box having a sidepanel disposed opposite said first sidewall, said sidepanel having a pivot bolt collar defining a pivot bolt hole therethrough, said box having a front panel disposed closer to said front edge of said housing than to said rear edge of said housing;

(k) said first sidewall having a setting plug hole defined therethrough, said setting plug hole being defined by two cylindrical surfaces joined by a ridge surface, one of said cylindrical surfaces having a larger diameter and being disposed closer to said exterior surface of said first housing sidewall than to said interior surface of said first housing sidewall, said ridge surface being disposed at a right angle to said cylindrical surfaces;

(l) said first sidewall defining a tool access opening therethrough, said tool access opening being oriented in concentric registry with said pivot bolt hole defined in said sidepanel of said box;

(m) a front edge collar disposed closer to said front edge of said housing than to said rear edge of said housing, said flange extending at a right angle from said housing;

(n) a removable backframe configured to engage said rear edge of said housing, said backframe having an integrally connected top ledge, a first side strut, a bottom ledge disposed opposite said top ledge, and a second side strut disposed opposite said first side strut, each of said top and bottom ledges having an abutment ridge extending from respective exterior surfaces of said ledges and for disposing against said rear edge of said housing, each of said top and bottom ledges having at least two attachment tabs projecting outwardly from an outside surface of said ledge and disposed in registry with said tab openings in said respective top and bottom of said housing when said backframe engages said rear edge of said housing, said top ledge having a closure surface extending at a right angle therefrom and toward said bottom ledge, said top ledge having a closure flap integral with said closure surface and extending from said top ledge at a right angle thereto and toward said bottom ledge, said closure flap being disposed near one of said struts so as to be in at least partial registry with said spring box when said backframe engages said rear edge of said housing, said backframe having at least one rib extending between said top ledge and said bottom ledge, said backframe having at least one cross brace extending between said first strut and said second strut, said bottom ledge having at least one closure stop member extending above the interior surface of said bottom ledge and extending to a forward free edge of said bottom ledge, said bottom ledge having a rotation stop member extending above the interior surface of said bottom ledge and disposed closer to a rearward free edge of said bottom ledge than to said forward free edge of said bottom ledge;

(o) at least two elongated louvers, each said louver defining a longitudinal axis of rotation, each opposite end of each said louver defining a pivot bolt recess disposed longitudinally therein, one end of each said louver defining a first receiving collar and the opposite end of each said louver defining a second receiving collar, each said receiving collar defining a rotation post hole therethrough, each said louver having a forward-extending free edge, at least one of said louvers defining a generally S-shaped transverse cross-section, said S-shaped louver having a rearward-extending free edge, one of said louvers being shorter than said other louver and having one end disposed near said spring box sidepanel;

(p) at least one pivot bolt, each said pivot bolt having a shaft and a head disposed transversely to said 12 shaft, each said pivot bolt shaft extending into one of said pivot bolt recesses of one of said louvers to rotatably support one end of said corresponding louver;

(q) an elongated drive element having at least one rotation post extending therefrom and through one of said receiving collars of one of said louvers to rotatably engage said collar, each said rotation post having a bifurcated shaft and defining a flared head at the free end thereof;

(r) an elongated linkage element having at least two spaced apart rotation posts extending therefrom, each rotation post extending rotatably through a respective receiving collar on opposite ends of said louvers from the ends receiving said rotation post of said drive element;

(s) a bimetallic coil disposed in said spring box and having a free end disposed from the outer circumference of said coil and engaging said drive element, said coil having an opposite free end disposed inside said coil;

(t) a setting plug having a shaft configured to extend through said setting plug hole defined in said first sidewall, one end of said shaft being bifurcated and the opposite end of said shaft having a head flange extending radially from said shaft, said inner end of said coil being held by said bifurcated end of said setting plug, said head flange and a portion of said setting plug shaft defining a longitudinally extending recess configured for receiving a tool therein by which said setting plug can be selectively rotated in said setting plug hole;

(u) a pivot bolt extending through said pivot bolt hole defined in said pivot bolt collar in said first sidepanel of said spring box, said pivot bolt rotatably engaging said pivot bolt recess in the end of said shorter louver disposed near said box;

(v) a grille integrally connected to said housing and said front panel of said spring box and disposed across said air passageway;

(w) a screen disposed against said grille; and

(x) an insert configured to fill said tool access opening and disposed therein to seal same.

4,962,883

AIR CONDITIONING SYSTEM FOR A MOTOR VEHICLE

Hermann Burst, Rutesheim, and Walter Pross, Sindelfingen, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Oct. 13, 1989, Ser. No. 421,359

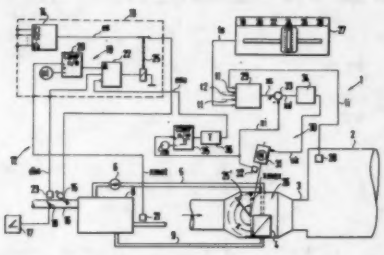
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1988, 3836992

Int. Cl.[5] G05D *23/00*

U.S. Cl. 237—2 A **12 Claims**

1. An air conditioning arrangement for a motor vehicle with an internal combustion engine whose fuel/air mixture supply system is equipped with a fuel cut-off in a coasting operation, the air conditioning arrangement being controllable and converting waste heat generated by the internal combustion engine for heating at least one passenger compartment of the motor vehicle and having a control element which indirectly or directly influences heating of the passenger compartment of the motor vehicle, a position of the control element, corresponding to a heat requirement, being controllable arbitrarily

between a minimum value and a maximum value, wherein fuel cut-off control is provided for at least temporarily stopping the



fuel cut-off in the coasting operation when the control element is in a position in a range of a maximum value.

4,962,884

HEAT ACCUMULATING TYPE ELECTRIC UNDERFLOOR HEATING SYSTEM HAVING UPPER AND LOWER CAVITIES AND A METHOD FOR HEATING THE SAME

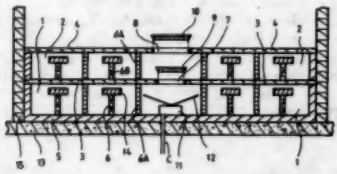
Yoeng T. Choi, 292-52, Imoon-Dong, Tongdaemoon-ku, Seoul, Rep. of Korea

Filed Aug. 30, 1989, Ser. No. 400,555

Claims priority, application Rep. of Korea, Aug. 30, 1988, 11023/88

Int. Cl.[5] F24D *5/10*

U.S. Cl. 237—69 **6 Claims**



4. A method for heating using an underfloor heating system, in which a noncombustible heat source is connected with a conductive line and positioned in an airtight cavity, said underfloor heating system including members of auxiliary heat accumulating material arranged within lower and upper cavities and supported on support columns fixedly installed on a lower panel and on a lower support surface, said lower cavity being provided between said lower support surface and said lower panel, a lower opened part being formed in said lower panel, said upper cavity being provided between said lower panel and an upper panel, and upper opened parts being formed in said upper panel, comprising the steps of:

heating an accumulating heat in the lower panel, support columns and members of auxiliary heat accumulating material of the lower cavity, and radiating heat therefrom using hot air as heat transfer media;

then heating an accumulating heat in the upper panel, the support columns and the members of the upper cavity, and radiating heat therefrom using the hot air, whereby proper heat is radiated from the upper surface of the upper panel;

radiating the hot air on the upper surface of the upper panel and heating a chamber or a room by the hot air; and

uniformly heating a room for a fixed time period after the noncombustible heat source is cut off and the hot air is not supplied, by radiating accumulated heat.

4,962,885

PROCESS AND APPARATUS FOR SPRAYING LIQUID

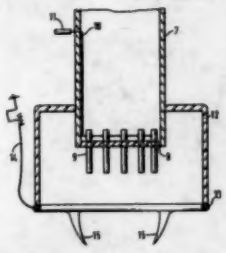
Ronald A. Coffee, Thursley Copse, Farnham Lane, Haslemere, Surrey, United Kingdom

Continuation of Ser. No. 323,234, Mar. 14, 1989, abandoned, which is a continuation of Ser. No. 579,074, Feb. 10, 1984, abandoned, which is a continuation of Ser. No. 30,757, Apr. 17, 1979, abandoned. This application Oct. 24, 1989, Ser. No. 425,431

Claims priority, application United Kingdom, Apr. 17, 1978, 78-14967

Int. Cl.[5] B05B *5/02*

U.S. Cl. 239—3 **8 Claims**



1. A process for spraying liquid at a target, which comprises atomizing liquid by charging it electrostatically at a charged conductive surface, projecting the charged atomized liquid on a path toward the target and at least partially discharging the charged particles so formed with an ionic discharge induced by the particles as they pass an earthed electrode having a sharp or pointed edge sited adjacent said path and pointing away from said charged conductive surface.

4,962,886

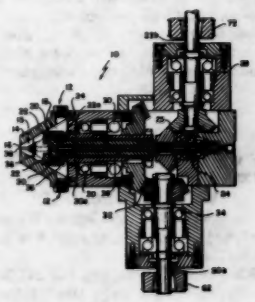
HIGH FLOW RATE NOZZLE SYSTEM WITH PRODUCTION OF UNIFORM SIZE DROPLETS

Ivar H. Stockel, Bangor, Me., assignor to The Board of Trustees of the University of Maine, Bangor, Me.

Filed Oct. 14, 1988, Ser. No. 258,203

Int. Cl.[5] B05B *1/08, 7/08, 7/10*

U.S. Cl. 239—11 **36 Claims**



1. A method for production of substantially uniform size droplets from a flow of liquid flowing through a first nozzle in the axial flow direction of the nozzle comprising:

forming the flow of liquid into a first annular flow of liquid;

periodically modulating the momentum of the annular flow of liquid in the axial flow direction at controlled frequency;

imparting a cross flow direction component of momentum in

the form of a swirl to the annular flow of liquid thereby forming a first modulated flow of liquid having axial flow direction and cross flow direction components of momentum;

and spraying the so formed first modulated flow through a first nozzle outlet to form a desired spray configuration.

4,962,857

ACCUMULATOR FUEL INJECTION SYSTEM

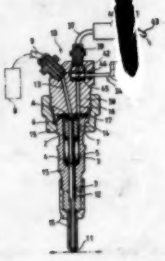
Hiroshi Matsuoka, Yamato, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Oct. 6, 1989, Ser. No. 418,355

Claims priority, application Japan, Oct. 21, 1988, 63-263994

Int. Cl.[5] F02M 47/02, 57/02

U.S. Cl. 239—95 **10 Claims**



1. An accumulator fuel injection system comprising a fuel injection pump for use in supplying a fuel, a fuel injection nozzle body provided with a fuel passage for receiving the fuel supplied from said fuel injection pump, an accumulator formed in said fuel injection nozzle body and used to temporarily accumulate a fuel supply pressure from said fuel injection pump, a check valve provided in said fuel injection nozzle body and adapted to be opened in response to a level, which is not lower than a predetermined level, of a fuel supply pressure in said fuel passage so as to supply the fuel from said fuel passage to said accumulator, injection ports formed in said fuel injection nozzle body so as to inject the fuel therefrom, a needle valve provided in said fuel injection nozzle body so as to open and close said injection ports, a first leak passage formed in said fuel injection nozzle body and constantly communicating with said accumulator, a control valve provided in said first leak passage so as to switch between an opened and closed states of said first leak passage and adapted to open said first leak passage so as to reduce the pressure in said accumulator to a level not higher than a pressure for closing said needle valve, and a means for opening and closing said control valve by the energization of a solenoid.

4,962,888

PORTABLE DEVICE FOR THE STORAGE OF WATER UNDER PRESSURE SUPPLIED, WHEN DRAWN, AS A BROKEN FORCED JET

Giuseppe Beccaria, Via dei Giuochi Istmici 7, Roma; Enzo Fava, Via Valdice 7, and Giuseppe Manfredini, Via A. Bravi 26, both of Recanati MC, all of Italy

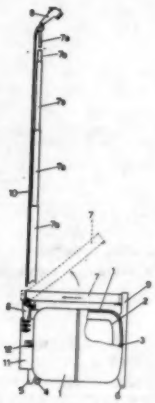
Filed Jan. 26, 1989, Ser. No. 301,548

Claims priority, application Italy, Dec. 29, 1988, 602/88[U]

Int. Cl.[5] B05B 9/047, 15/08

U.S. Cl. 239—152 **12 Claims**

6. A portable device for the storage of water under pressure which is supplied when drawn as a broken forced jet, comprising a cylindrical tank in which a storage bag of an elastic water-proof membrane is fitted, the water being stored in the bag, compressed air being forced through a valve positioned on the tank such that the compressed air may be introduced between the tank and the bag, a hose having a first end connected to the storage bag, the hose having a second end having a nozzle connected thereto such that the water under pressure may be loaded in the tank through the nozzle and water from the tank may be drawn from the nozzle; the nozzle having a ring nut thereon for connection to a water supply tap a rod



carried by the device and having an end extending upwardly therefrom, the rod being telescoped, such that the end of the rod may be adjusted to a desired height above the device, and means for mounting the nozzle on the end of the rod.

4,962,889

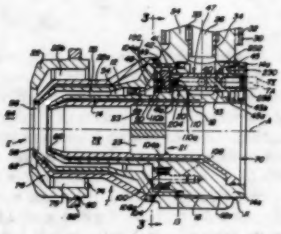
AIRBLAST FUEL INJECTION WITH ADJUSTABLE VALVE CRACKING PRESSURE

Robert M. Halvorsen, Birmingham, Mich., assignor to Fuel Systems Textron Inc., Walled Lake, Mich.

Continuation-in-part of Ser. No. 131,579, Dec. 11, 1987, Pat. No. 4,831,700. This application Apr. 12, 1989, Ser. No. 336,774

Int. Cl.[5] B05B 7/10, 7/06

U.S. Cl. 239—410 **9 Claims**



1. An airblast fuel injector having injector body means for forming an inner air chamber with a downstream air discharge orifice, an outer air chamber with a downstream air discharge orifice and an annular fuel chamber between the inner and outer air chambers with a downstream fuel discharge orifice, said injector body means forming a passage between the annular fuel chamber and an upstream fuel inlet chamber, a valve seat member adjustably received in said passage and having a fuel bore for receiving fuel from said fuel inlet chamber and terminating in a fuel discharge port, and an arcuate spring valve disposed on the injector body means and including a cantilever end portion overlying the fuel discharge port and biased against the valve seat member over the fuel discharge port when fuel pressure is below a minimum value and open-

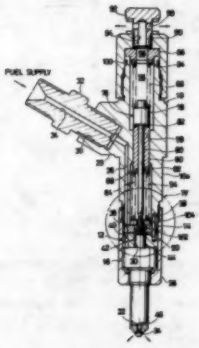
able when fuel pressure exceeds a selected value to allow fuel flow discharge from the fuel discharge port to the annular fuel chamber, said valve seat member being adjustable in position in said passage relative to the cantilever end portion of said valve from the exterior of said injector body means to adjust the valve opening pressure.

4,962,890

FUEL INJECTION VALVE ASSEMBLY

Takashi Shindo; Shiro Kurosawa, and Kazuhiko Sato, all of Matsuyma, Japan, assignors to Diesel Kiki Co., Ltd., Japan

Filed Sep. 22, 1989, Ser. No. 411,560
Claims priority, application Japan, Sep. 19, 1988, 63-121648[U]; Mar. 6, 1989, 1-51949
Int. Cl.[5] F02M 61/10
U.S. Cl. 239—533.4 21 Claims



1. A two-stage opening fuel injection valve assembly, comprising

(a) a valve element having an initial position providing a substantially zero flow rate of fuel through the valve assembly, a first critical position displaced a first predetermined distance from the initial position in a predetermined direction and providing a first flow rate of fuel through the valve assembly, a second critical position further displaced a second predetermined distance from the first critical position in said predetermined direction and providing a second flow rate of fuel through the valve assembly,

(b) first and second movable members which are engageable with said valve element independently of each other,

(c) intermediate means constantly engaged by said valve element and engageable with each of said first and second movable members,

(d) first biasing means urging said first movable member toward a predetermined position to engage said intermediate means when said valve element is held in said initial position, the first biasing means being operative to maintain the engagement between said first movable member and said intermediate means when the valve element is located between said initial position and said first critical position,

(e) second biasing means urging said second movable member toward a predetermined position to engage said intermediate means when said valve element is moved from said initial position to one of said first and second critical positions, the second biasing means being operative to maintain the engagement between said second movable member and said intermediate means when the valve element is located between said first and second critical positions, and

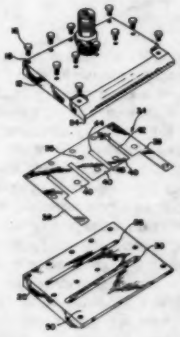
(f) displacement limiting means preventing movement of said valve element beyond said second critical position in said predetermined direction.

4,962,891

APPARATUS FOR REMOVING SMALL PARTICLES FROM A SUBSTRATE

Lawrence M. Layden, Stanton, N.J., assignor to The BOC Group, Inc., New Providence, N.J.

Filed Dec. 6, 1988, Ser. No. 280,775
Int. Cl.[5] B05B 1/00
U.S. Cl. 239—597 20 Claims



1. Apparatus for removing small particles from a substrate comprising:

(a) a source of fluid carbon dioxide under pressure and having an enthalpy below about 135 BTU per pound based on an enthalpy of 0 at 150 psia for a saturated liquid, so that a solid fraction will form upon the expansion of the fluid carbon dioxide to the ambient pressure of the substrate;

(b) a nozzle having a first opening for receiving the fluid carbon dioxide from the source and a second opening for emitting a mixture of solid and gaseous carbon dioxide toward the substrate, said nozzle further comprising, said

(1) a pair of plates adapted to be superimposed over each other collectively defining a first chamber connected to the first opening and a second chamber spaced apart from the first chamber;

(2) a foil-like member interposed between the superimposed plates comprising a hole aligned with the first opening for providing a pathway for the flow of fluid into the first chamber, and at least two finger-like projections extending from the first chamber to the second chamber and together with the superimposed plates forming at least one first channel providing flow communication between the first and second chambers, wherein the at least one first channel is sized to form a restriction such that the fluid forms a first mixture of gaseous carbon dioxide and fine droplets of liquid carbon dioxide in the at least one first channel and wherein the first mixture is converted in the second chamber to a second mixture containing gaseous carbon dioxide and large liquid droplets of carbon dioxide; and

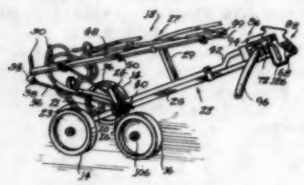
(3) a second channel extending from the second chamber to the second opening enabling the second mixture to expand into said mixture of solid and gaseous carbon dioxide and exit out of the second opening toward the substrate.

4,962,892

MOBILE MATERIAL DISTRIBUTION APPARATUS

C. J. Sauer, Evansville, Ind., assignor to Chem-Farm, Inc., Evansville, Ind.

Filed Jan. 18, 1989, Ser. No. 298,573
Int. Cl.[5] B05B 1/20
U.S. Cl. 239—722 9 Claims



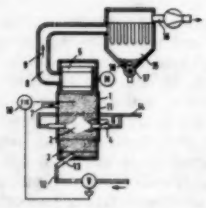
1. A manually movable spraying apparatus for generally uniformly distributing materials along a path of travel comprising: frame means; primary ground engaging means operatively attached to said frame means along a common axis supporting said frame means for providing mechanical advantage in moving said apparatus over a surface; spray nozzle means operatively attached to said frame means above said surface and substantially offset from said axis, pivotal movement of said frame means about said common axis causing a variation in height of said nozzle means above said surface; secondary ground engaging means adjustably attached to said frame means for providing a mechanical advantage in moving said apparatus and for resisting pivotal movement of said frame means about said axis for maintaining said nozzle means at a spaced apart distance from said surface while moving said apparatus and; adjustable mounting means adjustably attached to said frame means and to which said secondary ground engaging means is operatively attached for adjustably controlling the height of said spray nozzle means above said surface, said adjustable mounting means including an adjustment bar bracket selectively positionable along said frame means and an adjustment bar being adjustably attached to said frame by said adjustment bar bracket.

4,962,893

PROCESS AND DEVICE FOR COLD MILLING

Klaus Bochmann, Wiesbaden; Hans-Joachim Risto, Ludwigshafen; Wolfgang Volker, Tonisvorst; Helmut Gursky, Frankfurt, and Dieter Steidl, Hofheim, all of Fed. Rep. of Germany, assignors to Messer. Griesheim, Fed. Rep. of Germany

Filed Oct. 2, 1989, Ser. No. 415,884
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1988, 3833830
Int. Cl.[5] B02C 19/06
U.S. Cl. 241—5 10 Claims



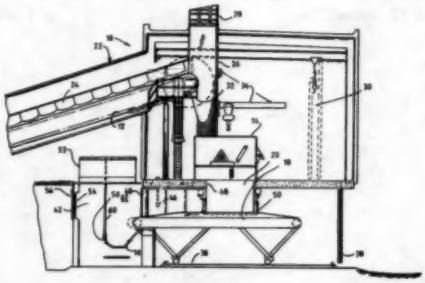
1. In a process for cold milling in a fluidized-bed counter-jet mill including exposing a milling chamber to gas jets, feeding the material to be milled to the chamber, separating the coarse material from the fine material in a grader, and providing a sump beneath the milling chamber for added material to be milled as well as for coarse material coming back from the grader, the improvement being in that cooling the coarse material coming back from the grader by a cryogenic refrigerant within the fluidized-bed counter-jet mill while the coarse material is in its disperse phase.

4,962,894

METHOD AND ASSEMBLY FOR CONTROLLING DUST WITHIN A SOLID WASTE DISPOSAL SYSTEM

Russell J. Galgana, Clarksville, N.Y., assignor to Smith & Mahoney, P.C., Albany, N.Y.

Filed Jul. 24, 1989, Ser. No. 384,491
Int. Cl.[5] B02C 19/00
U.S. Cl. 241—30 22 Claims



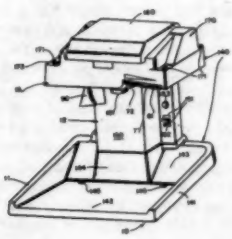
1. A solid waste disposal system comprising:
a shredder;
means for transporting solid waste material to said shredder;
means for conveying shredded solid waste material away from said shredder;
means for discharging shredded material from said shredder onto said conveying means;
a dust collector positioned above said conveying means for gathering airborne dust;
means for agitating said dust collector and causing dust gathered thereby to drop upon said conveying means subsequent to the discharging of shredded material onto said conveying means by said means for discharging and such that dust gathered by said dust collector does not reenter said shredder; and
means for spraying said dust dropped upon said conveying means with a liquid spray.

4,962,895

MACHINE FOR SHAVING ICE

Harold D. Gallaher, Wallen Rd., Bismarck, Mo. 63624

Division of Ser. No. 180,902, Apr. 13, 1988. This application Mar. 30, 1989, Ser. No. 330,820
Int. Cl.[5] B02C 19/12
U.S. Cl. 241—101.2 5 Claims



1. An ice shaving machine, comprising:

a frame having a base for supporting the machine on a supporting surface, an upstanding pedestal projecting upwardly from one side of the base, and a top supported on the pedestal so as to overlie the base in upwardly spaced relationship thereto;

said top including an ice receptacle supported on the pedestal for holding a quantity of ice to be shaved, said ice receptacle having a bottom with a first opening therethrough for discharge of shaved ice through the bottom of the ice receptacle, and further having a drain opening for draining melted ice away from the receptacle;

ice shaving blade means projecting into the ice receptacle for shaving ice placed therein;

a drain receptacle supported beneath the ice receptacle in position to catch moisture drained through the drain opening, said drain receptacle being disposed in spaced relationship below said ice receptacle and thereby defining a first air gap;

a drain pan supported on said base in spaced relationship below said drain receptacle;

a drain tube leading from the drain receptacle to said drain pan for conducting moisture from said drain receptacle to said drain pan and having a discharge end spaced from said drain pan to define a second air gap, said first and second air gaps functioning to prevent migration to the ice receptacle of molds and bacteria which might from in the drain tubes; and

a removable drain tray placed over said drain pan to catch shaved ice, said drain tray having a drain opening therethrough for draining melted ice into the drain pan and being liftable away from said drain pan for disposing of shaved ice collected in said drain tray.

4,962,896

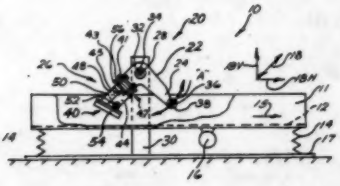
CONVEYOR HAVING A MATERIAL ATTENUATING DEVICE, AND A MATERIAL ATTENUATING DEVICE THEREFOR

Daniel J. Robinson, Louisville, Ky., assignor to Carrier Vibrating Equipment Co., Louisville, Ky.

Filed Jan. 12, 1989, Ser. No. 296,195

Int. Cl.[5] B02C *1/00*

U.S. Cl. 241—266 **14 Claims**



1. A vibratory conveyor comprising:

a. a trough structure along which material to be conveyed moves;

b. a vibratory generating device for imparting a vibratory force to the conveyor trough structure;

c. an attenuating device for attenuating material moving on the conveyor trough structure as the material is being conveyed comprising:

a lever arm over the conveyor trough structure;

means for mounting the lever arm for pivotal motion about a fixed point located directly over the trough structure;

means interconnecting the lever arm to the trough structure for transmitting the vibratory motion from the trough structure to the lever arm and for causing the lever arm to pivot about the fixed point as the conveyor trough structure vibrates conveying the material, and for causing a distal end of the lever arm to move out of phase with the vibratory motion of the conveyor trough such that as the vibrating conveyor trough structure moves upwardly, the distal end of the lever arm moves downwardly toward the conveyor trough structure and as the vibratory conveyor trough structure moves downwardly, the distal end of the lever arm moves upwardly away from the conveyor trough structure; and,

a tool at the distal end of the lever arm for movement with the lever arm and attenuating the material moving on the conveyor trough structure.

4,962,897

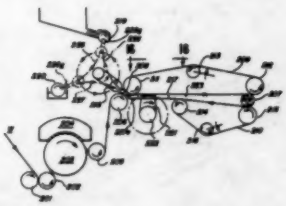
WEB WINDING MACHINE AND METHOD

John J. Bradley, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Division of Ser. No. 138,661, Dec. 28, 1987, Pat. No. 4,856,725, which is a division of Ser. No. 845,187, Apr. 1, 1986, Pat. No. 4,723,724. This application Mar. 23, 1989, Ser. No. 327,721

Int. Cl.[5] B65H *18/22, 19/22*

U.S. Cl. 242—67.1 R **10 Claims**



1. In a method of winding a web on a series of cores, said web having longitudinally spaced transversely extending lines of perforations, the steps of advancing said web along a path, pinching said web at a first point in said path while said web is advancing, and using a core to pinch said web against a stationary plate at a second point upstream of said first point and while a line of perforations is positioned between said points.

4,962,898

VIDEO TAPE CASSETTE

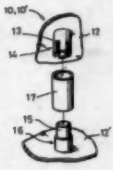
Jung Kwan Lee, Chunan, Rep. of Korea, assignor to SKC Limited, Seoul, Rep. of Korea

Filed May 18, 1989, Ser. No. 353,888

Claims priority, application Rep. of Korea, May 20, 1988, 88-7522

Int. Cl.[5] G11B *23/04*

U.S. Cl. 242—199 **3 Claims**



1. A video tape cassette, comprising:

a half up plate and a half down plate being assembled together to form said tape cassette;

means for securing said half up plate to said half down plate during their assembly to form the tape cassette; said means for securing including:

a boss with a supporting bar on a first end, said boss being connected at a second end to said half down plate;

an insertion tube having a plurality of incising grooves, said insertion tube being connected to said half up plate and disposed about said supporting bar and stopped against said boss; and

a tape guide being tubular in shape disposed against said boss to force press the insertion tube against the supporting bar so as to securely assemble the tape cassette.

4,962,899

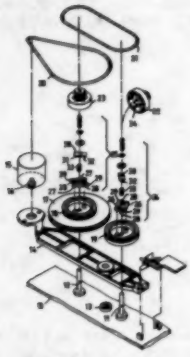
DUAL DIRECTION TRANSMISSION DEVICE OF A VIDEO CASSETTE REWINDER

David Tsi, 1st Floor, No. 17, Lane 180, Ho Chiang Street, Taipei, Taiwan

Filed Oct. 27, 1989, Ser. No. 427,561

Int. Cl.[5] G11B *15/32*

U.S. Cl. 242—201 **1 Claim**



1. A dual direction transmission device of a video cassette rewinder, comprising:

a pivoting member pivotably mounted on a base of a video cassette rewinder; a motor fixedly mounted at one end of the pivoting member and having a drive shaft; a first pulley fixedly mounted on the drive shaft of said motor; a second pulley rotatably mounted at a first position on the base of said video cassette rewinder; a third pulley coaxially connected with said first pulley; a fourth pulley rotatably mounted at a second position on the base of said video cassette rewinder; a first belt operatively connected between said first pulley and said second pulley; a second belt operatively connected between said third pulley and said fourth pulley; a first spindle coaxially and rotatably mounted on said third pulley; a second spindle coaxially and rotatably mounted on said fourth pulley; a first dual direction selecting mechanism mounted between said third pulley and said first spindle; and a second dual direction selecting mechanism mounted between said fourth pulley and said second spindle.

4,962,900

FISHING LINE REEL SELECTIVELY OPERATED IN THE RIGHT-HAND OR LEFT-HAND MODE

Klaus Dorbandt, Berlin, Fed. Rep. of Germany, assignor to D.A.M. Deutsche Angelgeraete Manufaktur Hellmuth Kuntze GmbH & Co., Fed. Rep. of Germany

Filed Sep. 16, 1988, Ser. No. 245,215

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1987, 3731553

Int. Cl.[5] A01K *89/027, 89/01*

U.S. Cl. 242—282 **20 Claims**

1. In a fishing line reel which is selectively adjustable into a right-hand mode and a left-hand mode of operation comprising a handle component for connecting said reel to a fishing rod, a housing which rotatably supports a crank and a crankshaft, a winding cap arranged to rotate with said crankshaft and an anti-reversing locking means arranged to prevent rotation of said crankshaft in a predetermined direction which depends on the mode of operation, the improvement comprising:

said crank is mounted in a bore located on one side of said housing;

said housing is rotatably mounted to said handle component between predetermined stop positions to establish said

right-hand and left-hand modes of operation and said anti-reversing locking means is rotatable with said housing; and

said handle component includes means arranged to activate said anti-reversing locking means when said housing is rotated such that the direction of rotation of said crank shaft permitted by said anti-reversing locking means is automatically reversed during rotation of said housing between the stop positions.

4,962,901

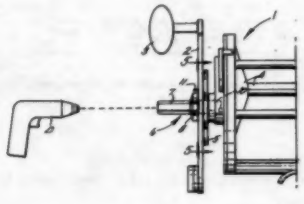
DRIVE MEMBER FOR A FISHING REEL

Ronald D. Shirley, 7310 N. Bank, Portland, Oreg. 97203, and Michael D. Cowan, 3247 SE. Deswell St., Milwaukie, Oreg. 97267

Filed Jul. 13, 1989, Ser. No. 379,290

Int. Cl.[5] A01K *89/017*

U.S. Cl. 242—323 **7 Claims**



1. A drive member for installation on a fishing reel, said reel having a drive shaft provided with a hand crank, said drive member permitting optional powering of the reel with a motor, said drive member comprising,

a shank having flats thereon for engagement with a chuck of a battery powered power source,

a head at one end of said shank having a wall surface for abutment with the hand crank, the head securing the hand crank on said drive shaft, said head having a peripheral edge defining a series of recessed areas in which a locking screw may be located to prevent movement between said head and the hand crank, and

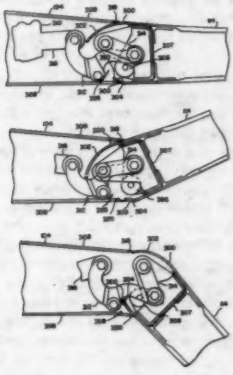
a threaded member integral with said head for threaded engagement with the drive shaft of the fishing reel.

4,962,902

AIRCRAFT CONTROL SURFACE LINKAGE

Rudy F. Fortes, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 20, 1989, Ser. No. 326,163
Int. Cl.[5] B64C 9/02
U.S. Cl. 244—75 R 32 Claims



1. An improved linkage for positioning a control surface pivotally mounted to an airfoil of an aircraft wherein the control surface has a linkage compartment at a forward end thereof, the linkage compartment having a substantially curvilinear outer shell portion that extends inwardly of the airfoil on the top and bottom thereof, the linkage for pivoting the control surface such that at least a portion of the outer shell of the linkage compartment is interior of the outer shell of the airfoil for all angular displacements, said linkage comprising:

actuator means coupled to the airfoil for providing a drive force to pivot the control surface; and

linkage means responsive to the drive force provided by said actuator means for positioning the control surface, said linkage means being pivotally coupled to the airfoil at a first pivot point and to said actuator means at a second pivot point spaced from said first pivot point, said linkage means being shaped to extend interior of the linkage compartment and being pivotally coupled to the control surface at a third pivot point spaced from said first and second pivot points to pivot the control surface in response to the drive force provided by said actuator means.

4,962,903

COOLING METHOD AND APPARATUS FOR WINGS AND OTHER FUSELAGE COMPONENTS

David E. Byron, Casselberry, Fla., assignor to Red Eye Arms, Inc., Winter Park, Fla.

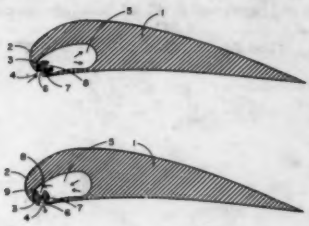
Continuation of Ser. No. 110,186, Oct. 19, 1987, abandoned.
This application Jul. 31, 1989, Ser. No. 387,378
Int. Cl.[5] B64C 3/36
U.S. Cl. 244—117 A 7 Claims

1. A method of cooling the leading edges of wings and other airframe components comprising:

taking ambient air from the airstream into the wings and other airframe components;

passing the air through a Venturi section consisting of converging and diverging nozzles into a chamber;

allowing the air in the chamber to become compressed and pressurized and then closing the Venturi section; and



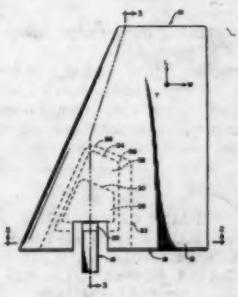
exhausting the air from the chamber by subsequently opening the same or another Venturi section into the ambient air.

4,962,904

TRANSITION FITTING FOR HIGH STRENGTH COMPOSITE

John S. Perry, and Harold A. Stowe, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 7, 1984, Ser. No. 618,566
Int. Cl.[5] B64C 1/06
U.S. Cl. 244—131 14 Claims

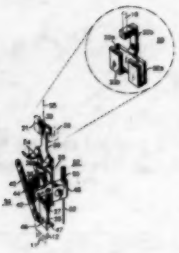


1. A transition fitting for a high strength composite article, comprised of a matrixed tailored skin support by and bonded to a core, to locate the same in an intended structural disposition subjecting the composite and fitting at or about a juncture thereof to bending and/or shear loads, said fitting comprising a profiled web disposed within said composite article and a shank for fixturing said article, said web including a longitudinal aspect projecting into said core from said juncture to a tip of said web, a lateral aspect projecting across said core bounding said juncture and a transverse aspect extending through said core; wherein said transverse aspect of said web tapers inwardly along the longitudinal direction of said web toward said tip and is dimensioned to provide load distribution means for transferring structural loads from said composite to said fitting along a longitudinal force gradient having a minimum force value at said tip and a maximum force value at said shank, and further wherein said lateral aspect is dimensioned to yield a web surface area selected to provide force balancing means for maintaining loads transferred to said web along said gradient below the interfacial shear limits at the juncture of said fitting, said core and said skin.

4,962,905
APPARATUS FOR HOLDING SAMPLES DURING SOLDERABILITY TESTING

Frank H. Friend, Southampton, Pa., and Kon-Mang Lin, Pennington, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 30, 1989, Ser. No. 373,559
Int. Cl.[5] B23K *37/00*
U.S. Cl. 248—125 **11 Claims**



1. Apparatus adapted for use with a solderability testing machine for holding a sample for immersion into a solder bath comprising:

a beam having attachment means at one end adapted to releasably engage a solderability testing machine so that the beam hangs vertically;

a clamping mechanism carried by the beam at a height below the attachment means and adapted to releasably engage a sample to hold it for immersion into a solder bath positioned therebeneath;

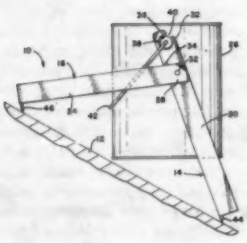
a projection extending horizontally outwardly opposite the clamping mechanism; and

a depth-controlling screw having a fine wire depending therefrom, the screw being threaded vertically through the projection so the wire depends below the beam for precisely controlling the depth of immersion of the sample in the solder bath therebeneath.

4,962,906
PAINT CAN HOLDER

Francis N. Fatool, R.D. #1, and Wade Fatool, 946 Reagan St., both of Sunbury, Pa. 17801

Filed Oct. 10, 1989, Ser. No. 419,268
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—148 **4 Claims**



1. A collapsible holder for supporting a can having bosses extending outwardly from upward sides of the can and a handle attached to the bosses on a sloping surface, the holder comprising:

a. first and second U-shaped members each formed from a metal strip and having a base and a pair of generally parallel legs extending away form the ends of the base to free ends with the ends of the members overlying each other;

b. pin hinge connections joining the overlying ends of the members together and permitting pivotal movement of the members between an open position in which the bases are apart and a closed position in which the bases are together, the free ends of the first member extending outwardly beyond the hinge connections;

c. stop means on the legs of the members near one hinge connection for limiting opening of the members, the stop means including a stop projection on one of said first and second members extending above the side of such member and located in the path of movement of the other of said first and second members toward the open position, such projection being engagable with an edge of such other member when the members are rotated about the hinge connections to the open position;

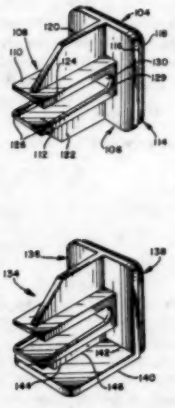
d. can support means on the free ends of said first member for removable surrounding engagement with the bosses on the side of a can positioned between such free ends, the can support means including opposed generally circular openings formed through such free ends and slots narrower than the openings extending through such free ends to the openings; said members being resiliently outwardly deformable to permit movement of the free ends over bosses on a can and the slots over a handle extending from the bosses and, upon release of the members, movement of the circular openings onto the bosses; and

e. surface engaging spikes on the base of the first member and extending below the base of said first member for securing the holder and supported can in place on a sloping surface.

4,962,907
DECORATIVE LIGHT HOLDER

Lonnie F. Gary, Lubbock, Tex., assignor to Gary Products Group, Inc., Lubbock, Tex.

Continuation-in-part of Ser. No. 257,392, Oct. 13, 1988, Pat. No. 4,901,960. This application Jan. 6, 1989, Ser. No. 294,266
Int. Cl.[5] A47B *96/00*
U.S. Cl. 248—205.3 **2 Claims**



1. A decorative light holder adapted to receive a decorative light socket and support a decorative light bulb and socket assembly by frictional contact between said holder and said socket, said holder comprising a base member having forwardly and rearwardly facing surfaces; a socket support member comprising a plurality of opposed support arms extending

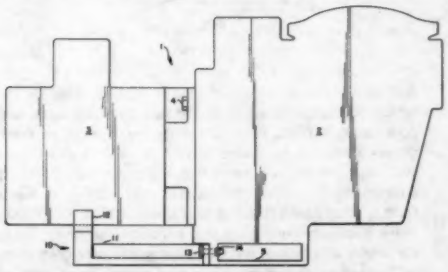
outwardly from the forwardly facing surface of said base member; a brace member connected to each of said support arms and to said base member; and an adhesive means affixed to the rearwardly facing surface of said base member; said opposed support arms further comprising opposed interiorly facing surfaces inwardly tapered in the direction of said base member, said surfaces of said support arms being adapted to provide frictional engagement with a decorative light socket inserted therebetween; said support arms further comprising a plurality of spaced apart ribs extending substantially perpendicularly from said facing surfaces of said support arms, said ribs being adapted to cooperate with said facing surfaces of said support arms to provide lateral support to said socket when inserted into said support member.

4,962,908

VARIABLE MOTOR SUPPORT

Wilfred B. Gerth, LaMirada, and Eduardo R. Deocampo, Walnut, both of Calif., assignors to Hydrotech Chemical Corporation, Marietta, Ga.

Filed Dec. 6, 1988, Ser. No. 280,572
Int. Cl.[5] F16M *3/00*
U.S. Cl. 248—674 **7 Claims**



1. In a pump having a volute housing and a motor, a variable motor support for accommodating differences in physical dimensions of a plurality of motors usable in the pump, comprising:

a pump foot member adjustable attached to the volute housing and including a shaped cavity; and

a foot member insert for engaging a surface of the shaped cavity and supporting the motor, the foot member insert being correspondingly dimensioned with respect to the shaped cavity and the physical dimensions of the plurality of motors.

4,962,909

MOLD FOR DENTISTRY

Wolfgang Kohler, Bahnhofsplatz 4, 8910 Landsberg, Fed. Rep. of Germany

PCT No. PCT/DE88/00295, § 371 Date Jan. 12, 1989, § 102(e) Date Jan. 12, 1989, FCT Pub. No. WO88/09155, PCT Pub. Date Dec. 1, 1988
PCT Filed May 19, 1988, Ser. No. 306,028
Claims priority, application Fed. Rep. of Germany, May 20, 1987, 8707277[U]; Feb. 8, 1988, 8801580[U]
Int. Cl.[5] A61C *13/20*
U.S. Cl. 249—54 **17 Claims**

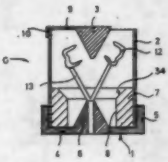
1. A dental casting mold for producing muffles for use in dental prosthetic manufacture comprising

a base being a funnel shaper, having a circular base plate and a central cone and circumferential vertical side wall extending upwardly from the base plate;

a cylindrical muffle ring inserted in the funnel shaper and having a base end thereof resting on the base plate and abutting an inner circumferential surface of the side wall;

a cylindrical ring inserted on the side of the muffle ring facing the funnel shaper, the central opening of which ring surrounds the cone; and

a blind funnel arranged at the end of the muffle ring opposite to the funnel shaper by a support said blind funnel consisting of a tapered funnel body tapering to a funnel tip, said funnel tip facing towards the cone of the funnel shaper;



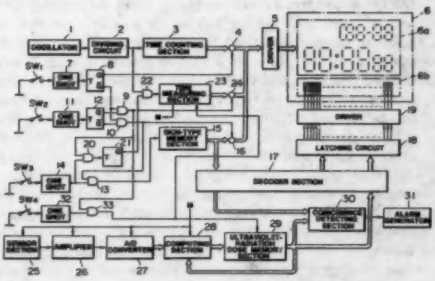
wherein the dimensions of said cylindrical ring and the blind funnel are established in such a way that approximately the same amount of embedding material is provided in the vertical, axial and transverse directions of the casting object mounted on the central cone of the base.

4,962,910

DEVICE FOR USE TO PREVENT HUMAN SKIN FROM EXCESSIVE SUNBURNS

Atsuko Shimizu, Akishima, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1989, Ser. No. 320,709
Claims priority, application Japan, Mar. 14, 1988, 63-59986
Int. Cl.[5] G01J *1/44*
U.S. Cl. 250—372 **20 Claims**



1. A device for use to prevent skin from sunburns, comprising:

input means for inputting data corresponding to a selected one of a plurality of skin-types representing skin-sensitivity to ultraviolet radiation;

sunburn-data setting means for obtaining data of ultraviolet radiation doses causing sunburns and corresponding to a plurality of different Sun Protection Factor values (SPF values) on the basis of the selected skin-type data inputted by said input means;

ultraviolet-radiation measuring means for measuring ultraviolet radiation doses;

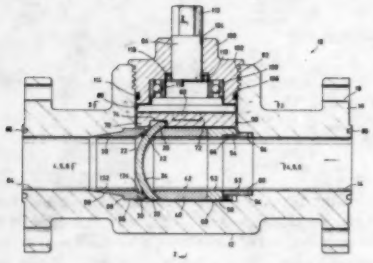
accumulative ultraviolet-radiation doses memory means for storing accumulative data of the ultraviolet radiation doses measured by said ultraviolet-radiation measuring means; and

alarming means for activating an alarm when the accumulative data stored in said accumulative ultraviolet-radiation dose memory means coincides with each of different ultraviolet radiation doses corresponding to a plurality of SPF values, said different ultraviolet radiation doses being obtained by said sunburn-data setting means.

4,962,911
HEMI-WEDGE VALVE

Paul B. Soderberg, Houston, Tex., assignor to Soderberg Research & Development, Inc., Houston, Tex.

Filed Mar. 27, 1990, Ser. No. 500,001
Int. Cl.[5] F16K *25/00, 1/18*
U.S. Cl. 251—159 20 Claims



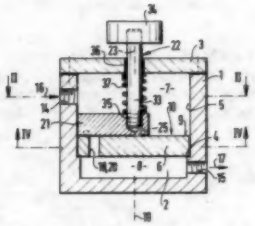
1. An improved valve, comprising:
a valve housing;
a fluid path through said housing from an inlet to an outlet both in said housing;
a valve seat disposed about said fluid path between said inlet and said outlet;
a rotatatable, curved wedge disposed in said fluid path, said wedge rotatable between an opened and a closed position, said wedge having a first, convex surface adjacent said valve seat and a second, concave surface opposite said valve seat, said surfaces forming a curved wedge having a thickness progressively increasing from a first end to a second end, said wedge having near said first end an opening through its thickness between said convex and concave surfaces to form a part of said fluid path in said opened position, said wedge blocking said fluid path with said progressively increasing thickness near its second end in said closed position to provide a more effective seal with said valve seat, said first surface being sufficiently large to shield and seal against said valve seat from fluid in said flow path in both said opened and closed positions;
means for actuating said rotatable, curved wedge between said opened and closed positions, said actuating means operatively connected with said wedge and extending through a sealed actuator opening in said housing; and
means for displacing said first surface toward said valve seat along fluid path as said rotatable wedge is rotated from said opened to said closed position.

4,962,912
RATE OF FLOW CONTROL VALVE

Kurt Stoll, Esslingen, Fed. Rep. of Germany, assignor to Festo KG, Esslingen, Fed. Rep. of Germany

Filed Sep. 21, 1989, Ser. No. 410,865
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1988, 3833494
Int. Cl.[5] F16K *3/32, 47/06*
U.S. Cl. 251—208 7 Claims

1. A flow rate regulating valve, comprising:
a housing having an inlet port and an outlet port for the fluid pressure,
a partition separating the cavity of the housing into two valve spaces each communicating with one of the respective ports,
said partition having a transfer port for the fluid to flow between the two valve spaces in the form of a cutout in the partition so as to extend from one valve space to the other, and
a rotary valve member arranged in one of the two valve spaces on the respective side of the partition and adapted for setting the desired rate of flow from one valve space into the other by turning such valve member in relation to the transfer port by an external force, such valve member being able to be turned between a closed setting completely covering the transport port and an open setting at least partly uncovering the transfer port, said rotary valve member providing a substantially continuous surface facing said transfer port in said closing setting, said continuous surface being free of any opening at least in a part which may be passed over the transfer port, said transfer port extending in a peripheral direction, with respect to axis of rotation of said rotary valve member of less than

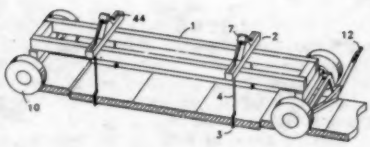


360° and defining a curved length with a cross section which continuously varies along said curved length, said continuous surface of said rotary valve member completely covering said transfer port in said closed setting and said continuous surface being positioned laterally adjacent said transfer port in said open setting to allow fluid to freely pass through said transfer port, said rotary valve member running on said partition and being in the form of a segment of a circle having a center coinciding with a center of said partition, said rotary valve member having an axis of rotation extending through said center, said segment of a circle having an outer periphery with an arc length greater than 180°.

4,962,913
SIDEWALK LIFTER

John V. Stewart, 1308 Henry Balch Dr., Orlando, Fla. 32810

Filed Oct. 24, 1988, Ser. No. 261,606
Int. Cl.[5] B66D *1/00*
U.S. Cl. 254—269 10 Claims



6. A concrete slab lifting device, comprising:
a plurality of elongated beams, generally horizontal and parallel;
support means mounted on each end of the beams for upholding the device;
a plurality of crossbeams mounted atop said elongated beams;
at least one of said crossbeams longitudinally repositionable upon said elongated beams;
a pair of generally C-shaped hooks suspended from opposite ends of each crossbeam;

means for adjustably selecting a horizontal distance between said pair of hooks along each crossbeam; and

winch means attached to each crossbeam for retracting said pair of hooks in unison, whereby objects of different widths may be lifted.

4,962,914

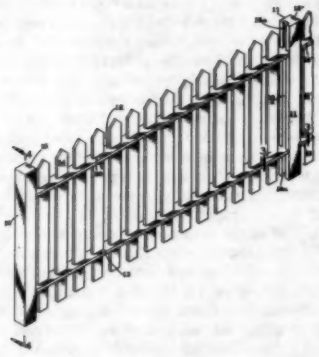
FENCE

Alva R. Taylor, 206 SE. 10th St., Apt. 101, Dania, Fla. 33004

Filed Feb. 26, 1990, Ser. No. 484,772

Int. Cl.[5] E04H *17/14*

U.S. Cl. 256—72 **8 Claims**



1. In a fence, the combination of:

a fence post;

at least one horizontal fence rail extending away from said post and having a plurality of openings in succession along its length away from said post;

means on said post and said rail providing a tongue-and groove-joint between them which enables the slidable adjustment of said rail along said post;

means for supporting said rail at a predetermined location along said post;

and a plurality of vertical fence slats slidably received individually in said openings in the rail and extending down through said rail, each of said slats having a tapered lower end segment wedged into the corresponding opening in said rail.

4,962,915

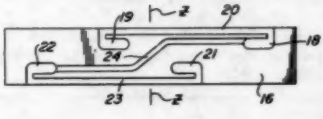
THREE-AXIS FLUID-FILLED MOUNT

Richard P. Thorn, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Jul. 18, 1989, Ser. No. 381,570

Int. Cl.[5] F16F *9/14*

U.S. Cl. 267—140.1 **13 Claims**



1. A fluid-filled mount for damping vibrations in at least three orthogonal directions, comprising:

a shell adapted to being mounted to a first object,

a connecting member at least partially disposed in said shell and adapted to being secured to a second object for movement relative to said first object,

means defining between said connecting member and said shell a plurality of pairs of resiliently deformable fluid chambers located in spaced relation in each of said orthogonal directions, and

means providing separate first, second and third fluid conduits connecting the fluid chambers in each of said pairs so that displacement of the connecting member in one direction of motion causes one of the fluid chambers along said direction to contract and to displace fluid therefrom into its companion fluid chamber,

whereby relative motion between the objects can be damped in at least one direction.

4,962,916

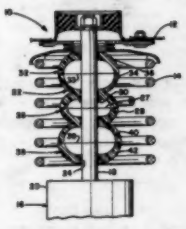
COMPRESSION SPRING

Richard L. Palinkas, Northfield, Conn., assignor to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed Nov. 17, 1989, Ser. No. 439,117

Int. Cl.[5] F16F *1/52, 13/00*

U.S. Cl. 267—153 **14 Claims**



1. An elastomeric spring having multiple spring rates comprising:

an elastomeric body having a bore extended there through coaxial with an axis of deflection, said body being formed of a smaller diameter lobe and a larger diameter lobe integral with said smaller diameter lobe and coaxially aligned along said axis of deflection, said smaller diameter lobe having a smaller outside diameter than said larger diameter lobe, said smaller and larger diameter lobes being hollow, flattened cylinders normal to said axis of deflection having cross sections with inner peripheral surfaces formed by an opposing pair of substantially semicircular arcs connected by a pair of substantially parallel straight lines normal to the axis of deflection, said bore passing through the portion bounded by said pair of straight lines, said larger diameter lobe being adapted to roll axially over said smaller diameter lobe when subjected to a load directed along the axis of deflection and having a wall thickness which varies from a minimum thickness portion adjacent to said smaller diameter lobe to a maximum thickness portion axially distal from said smaller diameter lobe.

4,962,917

MACHINE FOR HOLDING WORKPIECE

Kiniehi Tamura, Tokyo; Susumu Kawada, Kamakura; Yoshitada Sekine, Tokyo; Kazuyoshi Abe, Tokyo; Ryosuke Ishikawa, Tokyo, and Fumiki Yokota, Yamato, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Division of Ser. No. 25,975, Mar. 16, 1987, Pat. No. 4,811,935.

This application Feb. 13, 1989, Ser. No. 309,130

Int. Cl.[5] B23Q *1/04*

U.S. Cl. 269—56 **3 Claims**

1. In an assembly line:

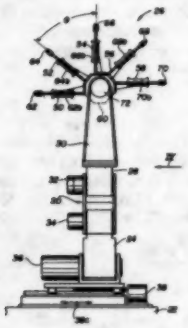
a plurality of workpieces having different cross sectional shaped adapted to be conveyed one after another;

a holding unit; and

means for guiding and positioning said holding unit;

said holding unit including a rotary seat rotatable relative to

said guiding and positioning means, a plurality of workpiece supporting devices designed for supporting the plurality of workpieces, respectively, and secured to said rotary seat and arranged angularly distant, and a rotary



actuator operatively connected to said rotary seat to rotate said rotary seat to bring a selected one of said plurality of workpiece supporting devices to a predetermined position in accordance with which one of said plurality of workpieces is conveyed.

4,962,918

CLAMPING SET HAVING DOUBLE-COORDINATE CLAMPING FUNCTION AND BEING EXTENSIBLE FOR ADJUSTING CLAMP DEPTH

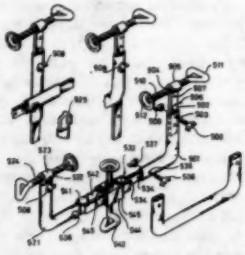
Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed May 4, 1989, Ser. No. 347,202

Claims priority, application United Kingdom, May 17, 1988, 8811613

Int. Cl.[5] B25B *1/10*

U.S. Cl. 269—156 **3 Claims**



1. A "C" type clamping assembly comprising in combination a flattened tubular frame having a main body, a first leg and a second leg, the legs being substantially parallel and at right angles to the main body, the main body;

having an intermediate section, the intermediate section being a bifurcated strap having two legs and having a plurality of upwardly extending teeth on each leg of the strap, the intermediate section further having a first flat strap section and a second flat strap section, each flat strap section extending outwardly in opposite directions from the bifurcated strap; a U-shaped slide block having at least two downwardly extending teeth thereon, the U-shaped block straddling the bifurcated section, the teeth on the U-shaped block cooperating with the teeth on the bifurcated section such that the U-shaped slide block may be moved laterally across the intermediate bifurcated section and secured in a desired position, the U-shaped block further having a threaded opening therethrough, a first threaded clamping rod being received in the threaded opening;

the first threaded rod having a first end extending outwardly from the frame for manual adjustment, the first threaded rod having a second end extending inwardly from the frame and having a first clamping member mounted thereon such that lateral movement of the U-shaped block produces similar lateral movement of the first clamping member;

the first flat strap section on the intermediate section being slidably received in the tubular frame of the main body near the first leg of the assembly, the second flat strap section of the intermediate section being slidably received in the tubular frame of the main body near the second leg of the assembly, the first flat strap section and the second flat strap section each having a plurality of spaced-apart transverse openings therein, the tubular frame section near the first leg and the tubular frame section near the second leg each having at least one transverse opening therein such that when the respective flat strap section slides in the respective tubular section the selected opening in the flat strap section communicates with the respective opening in the tubular frame section permitting adjustment of the size of the main body; a pin member removably received in the respective opening in the tubular frame section and in the respective communicating opening in the flat strap section such that the respective flat strap section is secured to the respective tubular frame section; means to secure the pin member in the opening;

the first leg and the second leg each having a respective end;

a second clamping assembly mounted on the end of the first leg and a third clamping assembly mounted on the end of the second leg, means for mounting the second and third clamping assemblies to the respective leg, the means for mounting the second and third clamping assemblies on the ends of the respective first leg and second leg being adjustable such that the second and third clamping assemblies may be extended outwardly from the end of the first leg and the end of the second leg; and

the second and third clamping assemblies each having a threaded opening therethrough, a second and a third threaded clamping rod being received in the respective second and third threaded openings, the second and third threaded rods each having a first end extending outwardly from the clamp for manual adjustment, the second and third threaded rods each having a respective second end extending inwardly from the frame and having a respective second and third clamping member mounted thereon, such that a workpiece of irregular shape may be securely clamped between the independently adjustable first, second and third clamping members.

4,962,919

BILL HANDLER

Isamu Azuchi, Hiratsuka; Hiroshi Fujikura, Yokohama; Yoshinobu Haruna, Fujisawa; Ryuichi Onomoto, Kusatsu, and Masato Nishikawa, Kyoto, all of Japan, assignors to International Business Machines Corp. and Omron Tateisi Elec., both of, Japan

Filed Feb. 10, 1989, Ser. No. 308,774

Claims priority, application Japan, Feb. 13, 1988, 63-31709; Feb. 15, 1988, 63-32579

Int. Cl.[5] B65H *3/06*

U.S. Cl. 271—3.1 **8 Claims**

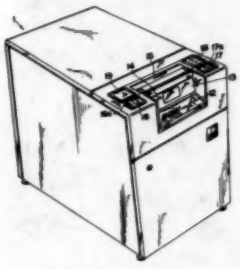
1. A bill handling apparatus having a bill discharge outlet (13) for discharging instructed kinds of and instructed numbers of bills comprising:

a single bill discharge outlet for shared use by two operators;

at least two receive members (42, 43) respectively disposed at a right side and at a left side of said outlet to receive discharged bills, each of said members being selectively moveable in a forward proceeded direction and a backward retracted direction;

means (16, 17) for inputting data to indicate whether an operator who is to receive the discharged bills is at a left or right position relative to said outlet; and

proceed and retract drive means (47, 61, 67, 70, 73, 83, 84) operative in response to the left or right position data



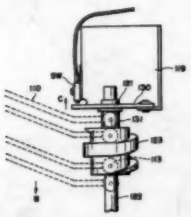
inputted from said input means for selectively moving that receive member disposed at a position opposite to the position indicated by the position data forwardly to a proceeded position to tilt bills discharged to said outlet towards one of said operators who is indicated by the position data.

4,962,920

SHEET SORTING DEVICE

Tadayuki Kitajima, Yokohama; Toshiyuki Asakawa, Sagamihara; Masataka Naito, Yokohama; Kazuhiro Matsuo, and Toshiaki Murayama, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 838,826, Mar. 12, 1986, Pat. No. 4,854,571.
This application May 17, 1988, Ser. No. 195,079
Int. Cl.[5] B65H *39/10*
U.S. Cl. 271—293 4 Claims



1. A sheet sorting device having:

a plurality of bin trays provided separately in a vertical direction;

support means for vertically movably supporting said bin trays;

revolution means for moving said bin trays vertically by revolution thereof, said revolution means being vertically movable relative to said bin trays when the vertical movement of said bin trays is prevented;

motor means for revolving said revolution means; and

detecting means for detecting the vertical movement of said revolution means when said revolution means moves vertically relative to said bin trays and stopping the revolution of said revolution means by controlling said motor means;

wherein said revolution means comprises cam means having a spiral groove, and a follower engaging said spiral groove is provided at the fore end of each of said bin trays and said spiral cam means is secured to a vertically movably supported shaft and moves vertically when upward or downward movement of said follower is impossible during the revolution of said spiral cam means.

4,962,921

INFLATABLE AQUATIC DEVICE

Thomas R. Simmons, 3510 Lobit, Dickinson, Tex. 77539-4310

Filed Oct. 2, 1989, Ser. No. 415,577
Int. Cl.[5] A63G *19/00*
U.S. Cl. 272—1 B 13 Claims

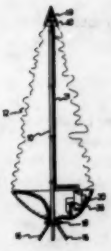
1. An inflatable device configured to support a person thereon, said device comprising one or more inflatable chambers constructed of flexible pliant material, and control means for controlling the inflation of at least one of said inflatable chambers by effecting the inflation and deflation of said chamber in rapid cyclical alternation whereby the cyclical inflation and deflation of said chamber imparts an oscillatory or accelleratory motion to said device.

4,962,922

APPARATUS FOR CIRCULATING ARTIFICIAL SNOW

Ven-Chung Chu, 3 Fl., No. 3, Lane 42, Yu Hsi St., Yung Ho City, Taipei Hsien, Taiwan

Filed Nov. 22, 1989, Ser. No. 440,327
Int. Cl.[5] A63J *5/02*
U.S. Cl. 272—15 3 Claims



1. In an apparatus for use with a tree for continuously cascading artifical snow particles through branches thereof, said apparatus including a particle receptacle cone constructed from a sheet of a pliable material provided in the form of a circular disc having a radial cut between a perimeter thereof and an aperture thereof, said radial cut forming two radial edges which overlap to form said receptacle cone including an interior surface with sufficient smoothness and sufficient downward incline from the periphery thereof to the cone axis such that, when said receptacle is installed at the base of the tree, gravitational force alone moves the particles along said interior surface into a bottom sump portion of said receptacle, a blower having an inlet conduit for taking up particles contained in said sump portion and an outlet conduit for delivering said particles to a point adjacent the top of the tree, and deflecting means which, when installed atop the tree, directs particles received from as outlet conduit downwardly through

the branches of the tree into said receptacle; the improvement wherein

said radial edges being reinforced with a rigid material such that when overlapped to form said receptacle cone said radial edges together form a rigid radial guide for encouraging said artificial snow particles into said sump portion of said receptacle cone.

4,962,923

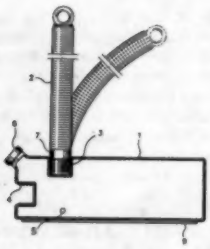
PORTABLE SWIMMING APPARATUS

Margaret D. Earner, 4942 Mt. Etna Dr., San Diego, Calif. 92117

Filed Apr. 24, 1989, Ser. No. 341,960

Int. Cl.[5] A63B *31/00*

U.S. Cl. 272—71 **1 Claim**



1. A portable anchoring device for supporting a swimmer's harness wherein the improvement comprises;

(a), a waterproof container of plastic, filled with water for ballast;

(b), the container having a bottom surface having a high coefficient of frictional resistance;

(c), a first threaded orifice on the top surface of the container;

(d), a second threaded orifice on one end surface of the container;

(e), a closable opening on the top of the container for filling the container with water;

(f), a flexible, rotatable, post having a threaded end mountable in the threaded orifices on the container;

(g), the post terminating in a circular ring at the top for attaching a line to the swimmers harness;

(h), a pin projecting from the back of the container adjacent to the threaded orifices; and,

(i), As a rod attachable to the pin for vertically attaching the container to the side wall of a swimming pool with the end threaded orifice at the top of the installed container.

4,962,924

BATTING TEE

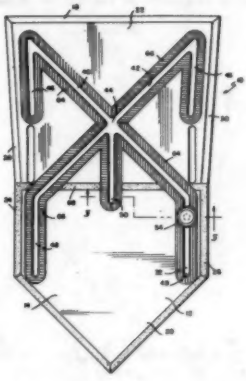
William J. James, R.R. 5, Box 15, Sullivan, Ind. 47882

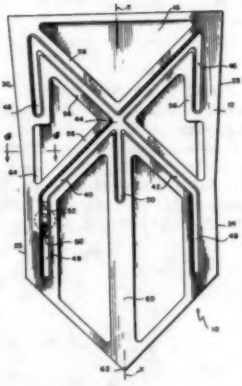
Filed Nov. 24, 1989, Ser. No. 440,801

Int. Cl.[5] A63B *69/00*

U.S. Cl. 273—26 R **20 Claims**

1. A batting tee comprising: a base having an upper and lower surface, the upper surface integrally including an elongated slot extending in a plurality of discrete directions over said surfaces, a fastener situated in said slot and adjustably movable with respect thereto, and an upright ball support





having a lower end coupled to the fastening means and an upper end adapted to support a ball.

4,962,925

EXERCISE BICYCLE

Chester Chang, No. 1-5, Chun Ting Hsiang, Ya Tan Rd., San Ho Tsun, Ta Ya Hsiang, Taichung Hsien, Taiwan

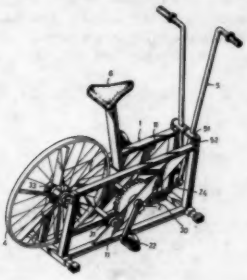
Filed Jul. 10, 1989, Ser. No. 377,312

Int. Cl.[5] A63B *21/00*

U.S. Cl. 272—73 **1 Claim**

1. An exercise bicycle comprising a frame body having a seat and a pair of handles, said frame body being generally a box shaped frame; a wheel being rotatably provided on said frame body; a middle portion of each said handle being pivoted on a front portion of said frame body; a multi-axial crank which has two crank arms being provided on said frame body; a lower end of each said handle being coupled to a respective crank axle of said multi-axial crank via a connecting link; a pedal being coupled to a free end of each said crank arm; and a gear transmission being coupled between said multi-axial crank and said wheel, said wheel transmission including a first driving gear fixed to a main crank axle of said multi-axial crank, a first pinion being engaged with said first driving gear and driven thereby, a second driving gear being coaxial with said first pinion and driven thereby, and a belt being coupled between

said second driving gear and a second pinion which is fixed on an axle of said wheel such that said wheel is drivable either by



a rotation of said multi-axial crank or by a back and forth movement of said lower ends of said handles.

4,962,926

SPHERICAL THROWING AND CATCHING DEVICE

Huei Mei Chen, No. 47, Lane 199, San Jiunn St., Shu Lin Town, Taipei Hsien, Taiwan

Filed Jan. 9, 1990, Ser. No. 462,567
Int. Cl.[5] A63B *43/02, 37/14*
U.S. Cl. 273—58 K 1 Claim

1. A handy toy having a substantially spherical, hollow body including a hollow, highly elastic core holder having a hole therein which can be stretched open for the insertion therein of a steel ball and can automatically contract to return to original size after the stretching force is released therefrom, said core holder comprising a large number of unitary, fine, floppy, elastic, circular rod-like filaments which uniformly radiate from said core holder to form therewith a hedgehog-like spherical body.

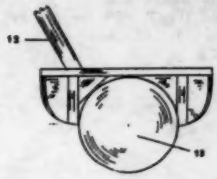
4,962,927

PUTTER HEAD

Nicholas Colucci, 67 Bache Ave., New York, N.Y. 10306

Filed Feb. 15, 1990, Ser. No. 480,309
Int. Cl.[5] A63B *53/00*
U.S. Cl. 273—162 E 2 Claims

1. A putter head comprising a blade having a front face including a sweet spot for striking a golf ball, a rear surface, a sole and weight distribution means including means for retrieving a golf ball, said retrieving means being defined by two substantially vertical, narrow walls, generally coextensive in height with that of said blade, on opposite sides of said sweet spot and extending rearward from said rear surface of said blade, the spaced apart distance between said walls being such that a golf ball to be retrieved can become wedged therebetween when the putter head is placed over a golf ball and pressure is applied downward, the bottom edges of said walls providing reduced resistance from grass while putting, said weight distribution means including a horizontal flange extending rearward from said blade, substantially perpendicular thereto, and generally coextensive with the upper edges of said



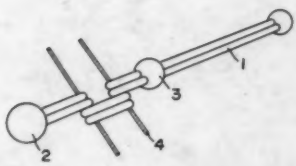
blade and said parallel walls, whereby said flange and said walls provide weight centered directly behind the sweet spot to provide a solid feel and directional control in putting.

4,962,928

ANTIVIBRATORY DEVICE FOR SPORTS RACKETS

Alpha Camara, c/o F.I. Sciences, 48 rue St. Sebastien, 06410 Biot, and Jean-Claude Bianchi, P.O. Box 46, Biot 06410, both of France

PCT No. PCT/FR87/00348, § 371 Date Aug. 1, 1988, § 102(e) Date Aug. 1, 1988, PCT Pub. No. WO88/02271, PCT Pub. Date Apr. 7, 1988
PCT Filed Sep. 9, 1987, Ser. No. 207,403
Claims priority, application France, Sep. 30, 1986, 86 13956; Sep. 30, 1986, 86 13958; Apr. 16, 1987, 87 05639
Int. Cl.[5] A63B *51/10*
U.S. Cl. 273—73 D 13 Claims



1. Anti-vibratory device for a sports racket, comprising an elastomer strip element alternately interlaced onto strung meshing of a hitting surface of said racket and including spherical protruberances at each end, said element forming a cohesive unit consisting of

(a) an elongated narrow segment (1) which ensures its cohesion to said hitting surface of said racket when said surface rebounds after contact with a ball, such cohesion being accomplished by successive weaving of said interlaced strip element over and under specific racket strings;

(b) protuberant coupling elements (2) at each end of said strip element which ensure coupling of respective strings by folding the strip around the crossing points between longitudinal and transverse strings of said hitting surface; and

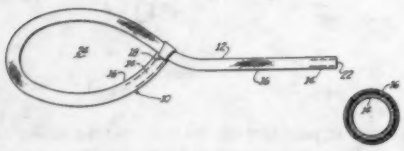
(c) at least one central coupling element (3) situated in the middle of said device in order to tauten it and hence locally increase its mass per unit length.

4,962,929

WRIST STRAP FOR ATTRACTING AN ITEM OF SPORTS EQUIPMENT TO THE WRIST

Eugene R. Melton, Jr., Fort Lauderdale, Fla., assignor to Lacer, Inc., Fort Lauderdale, Fla.

Filed Aug. 7, 1989, Ser. No. 390,078
Int. Cl.[5] A63B 49/00
U.S. Cl. 273—29 R 15 Claims



1. A slip knot attachment between the wrist of a user and an item of sports equipment comprising:

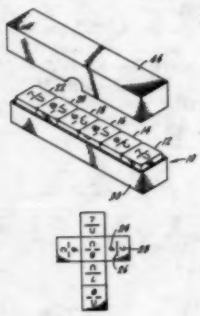
a single strand of tubular braid having two ends in which one end is inserted from an opening in the center of said braid and through the inside of the tube towards said other end to form a holding loop and in which said two ends are inserted through said holding loop to form a sliding loop.

4,962,930

METHOD AND APPARATUS FOR CASTING AN I CHING HEXAGRAM

Adrian L. Griffith, 6369 N. Paulina, Chicago, Ill. 60626

Filed Aug. 1, 1989, Ser. No. 387,775
Int. Cl.[5] A63F 9/00
U.S. Cl. 273—146 9 Claims



1. For casting the six lines of an I Ching hexagram in a single throw, a set of six dies each bearing a first indicia to denote the position of one of said lines in a hexagram, each die further having second indicia visible on the faces thereof, said second indicia denoting one of the types of lines of an I Ching hexagram, and further comprising alignment means for arranging the thrown dies in the correct order by placing the dies thereon.

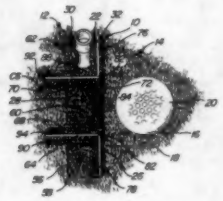
4,962,931

GOLF PUTTER

Matt Jazdzyk, Jr., 2343 Golfview Dr., Apt. 101, Troy, Mich. 48084

Filed Mar. 12, 1990, Ser. No. 492,054
Int. Cl.[5] A63B 69/36, 53/04
U.S. Cl. 273—164 4 Claims

4. A putter for optimizing the stroking of a spherical golf ball in a preselected path on the natural grass putting surface of a green comprising a head portion of predetermined mass that has a forward surface for contacting the ball, said head portion having an inboard end defining a heel and an outboard end defining a toe, a sole extending from the lower end of said forward surface to a terminal end defining a rear surface, said putter having an upper surface colored and textured to simulate the color and texture of the grass putting surface allowing the golfer to optimize concentration on squaring the head with



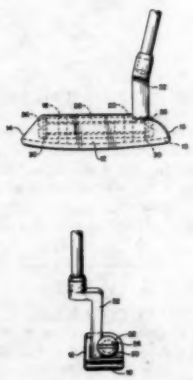
the intended line of the putt and swing of the head along the intended line without distraction from the shape of the head, and laterally spaced and discrete fins extending rearwardly from said head portion spaced a distance from one another approximating the diameter of said golf ball, readily visible indicia on the upper surface of fins to facilitate the golfer's aim and swing of the head of the putter so that the ball travels along the intended line of the putt.

4,962,932

GOLF PUTTER HEAD WITH ADJUSTABLE WEIGHT CYLINDER

Thomas G. Anderson, 55 S. Judd St. #1608, Honolulu, Hi. 96817

Filed Sep. 6, 1989, Ser. No. 404,329
Int. Cl.[5] A63B 53/04
U.S. Cl. 273—171 21 Claims



21. A head for a golf putter, comprising:

a substantially planar, slightly convex sole having a front edge and a rearward edge defining a sole depth of said sole, said sole depth being approximately equal to the raduis of a regulation a golf ball;

a substantially planar face having a face surface, a sole edge and an upper edge defining a face height of said face surface, a front end and a back end, attached at said sole edge to said front edge at substantially right angles, whereby said face surface and said sole surface define an angle of approximately 87°;

a first weight cylinder support having a first weight support aperture attached to said face adjacent to a toe portion and attached to said sole;

a second weight cylinder support having a second weight support aperture attached to said face adjacent to a heel portion and attached to said sole;

a weight cylinder having a center of gravity and a threaded weight receiving bore with a toe end and a heel end passing through and supported by said weight cylinder supports, whereby the center of gravity of said weight cylinder is supported above said sole approximately a distance equal to the raduis of a regulation golf ball, and is approximately centered between said front end and said back end of said face;

a threaded weighted toe bolt having a slot adapted for insertion of a coin threadingly engaged in said toe end of said weight receiving bore; and

a threaded weighted heel bolt having a slot adapted for insertion of a coin threadingly engaged in said heel end of said weight receiving bore;

wherein said toe bolt and said heel bolt are selected from a plurality of toe weights and heel weights weighing various predetermined amounts.

4,962,933

GOLF SWING PRACTICE DEVICE

Toshifumi Awazu, and Hiroshi Awazu, both of 301 - 1945 Barclay Street, Vancouver, British Columbia, Canada V6G 1L2

Filed Jan. 30, 1989, Ser. No. 304,013

Int. Cl.[5] A63R *69/36*

U.S. Cl. 273—186 C **9 Claims**

1. A golf swing practice device comprising, in combination:

(a) means defining an elongate generally flat guide member having a lineal guide edge adapted to be placed on the ground adjacent a golf ball to be struck with said lineal guide edge extending parallel to the desired and intended line-of-flight of the golf ball;

(b) an upstanding l-shaped guide element defining a swing plane stabilizer, said element having a horizontal leg secured to said guide member, and a vertical leg spaced from said guide member in a plane parallel thereto; and

(c) means for adjustably, but fixedly, securing said horizontal leg to said elongate generally flat guide member at any selected desired position along the length of said guide member with said vertical leg of said guide member defining an unobtrusive, imaginary, vertical guide plane parallel to the desired and intended line-of-flight of the golf ball so that when a golfer addresses the golf ball to be struck, said unobtrusive, imaginary, vertical guide plane tends to induce the golfer to commence his/her backswing with the club head passing closely adjacent to and somewhat below the upper end of said vertical leg and to cause the golfer's downswing to follow a desired inside-out trajectory.

4,962,934

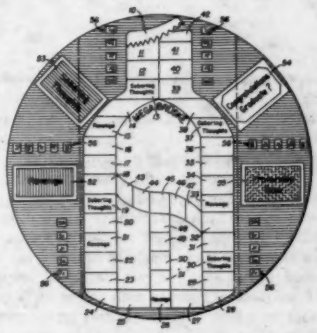
GAME APPARATUS

John C. Taylor, 6650 E. Arizona, Denver, Colo. 80224

Continuation-in-part of Ser. No. 96,162, Sep. 11, 1987, abandoned. This application Jun. 5, 1989, Ser. No. 361,228

Int. Cl.[5] A63F *3/00*

U.S. Cl. 273—249 **16 Claims**



14. An apparatus for a game simulating college experiences and the effects that alcoholic beverages may have on a students success in completing the college course, comprising in combination a game board having a main path comprising a series of successive playing positions extending around the board from a starting position to a finishing position each playing position representing a happening in a college career, or giving instructions or requiring the taking of a card,

a shortcut path extending from a position on one side of said series of playing positions to a position on the other side of said series,

a return path between a position on said short-cut path and a position on said main path intermediate the ends of said shortcut path,

playing pieces movable into said playing positions for indicating the respective positions of the players, a chance means for determining the movements of the playing pieces,

a plurality of stacks of instructions cards,

a plurality of positions at intervals along said main path each designating a stack from which a card is to be drawn, the positions on said main path intermediate said card stack positions having thereon instructions for the player,

a player who lands on the entrance to said shortcut path being required to take the shortcut on his or her next turn and on landing on the entrance to said return path being required to follow said return path one position at a time on each of the next turns of play until he or she again reaches the main path, a plurality of said positions requiring the player to draw a card from the return path stack,

the instructions on said cards and on said intermediate positions including directions for the taking or giving of drinks by the player.

4,962,935

APPARATUS FOR PLAYING A RACQUET AND BALL GAME IN A CONFINED SPACE

John M. Williams, Ashmore, Australia, assignor to Squeenis Pty. Ltd., Ashmore, Australia

PCT No. PCT/AU87/00173, § 371 Date Mar. 14, 1988, § 102(e) Date Mar. 14, 1988, PCT Pub. No. WO87/07519, PCT Pub. Date Dec. 17, 1987

PCT Filed Jun. 16, 1987, Ser. No. 183,185

Claims priority, application Australia, Jun. 16, 1986, PH6427

Int. Cl.[5] A63B 71/02

U.S. Cl. 273—411 9 Claims

1. An apparatus for playing a ball game, said apparatus comprising:

an enclosed playing arena having a generally rectangular playing area;

upright wall means surrounding said playing area and including at least one pair of opposed side walls;

roof means extending over said playing arena and extending between opposed upper regions of said wall means; and,

a plurality of upright spaced substantially parallel barrier means extending transversely of said playing area to divide said playing area into two substantially equal player's zones, said player's zones each including a ball service boundary marked on and extending transversely of each said player's zone, an upper edge of each said barrier means being spaced from said roof means; and

wherein upper portions of said at least one pair of opposed side walls are inclined inwardly at an angle of between 30 degrees and 60 degrees relative to upright portions of respective ones of said opposed side walls.

4,962,936

SEALING UNIT

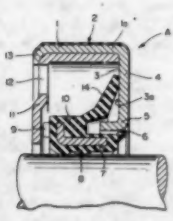
Noboru Matsushima, Fukushima, Japan, assignor to Nok Corporation, Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 287,026

Claims priority, application Japan, Dec. 24, 1987, 62-196390

Int. Cl.[5] F16J 15/32, 15/34

U.S. Cl. 277—37 16 Claims



1. A seal unit including two members for sealing between a rotary bore and a stationary shaft comprising:

a rotary member comprising an outer cylindrical portion for mounting by a press fit in a rotary bore, a radial flange portion extending radially inwardly from one end of said cylindrical portion and having an inside surface, and a curved portion at the radially innermost portion of said radial flange portion;

a stationary member comprising an inner anchor portion for snugly fixing on a stationary shaft, at least a main axial seal lip contacting in sealing engagement said inside surface of said radial flange portion for sealing fluid inside the seal unit, and at least an auxiliary dust lip exerting light pressure against said curved portion of said radial flange portion for excluding dirt from entering the seal unit between said dust lip and said curved portion; and

hydrodynamic grooves on said inside surface of said radial flange portion.

4,962,937

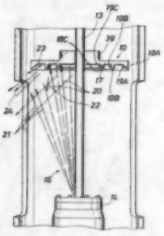
APPARATUS FOR DEFLECTING FLUIDS LEAKING AROUND PUMP SHAFTS

Jack E. Ashenfelder, Jr., 10810 Longren, Houston, Tex. 77089

Filed Mar. 21, 1989, Ser. No. 326,329

Int. Cl.[5] B65D 53/00; F16J 15/40; B64C 11/16

U.S. Cl. 277—68 20 Claims



1. A fluid deflector to be mounted on the driving shaft of a rotating pump for laterally deflecting fluids leaking from the shaft seal of that pump and comprising:

a circular member having a central opening therein for receiving a pump shaft;

means on said circular member for deflecting fluids leaking through a shaft seal and including a transverse fluid-deflecting surface on said circular member coaxially disposed around said central opening and extending laterally outwardly therefrom so as to be contacted by such leakage fluids, a peripheral rim on said circular member arranged to define an outwardly-diverging fluid-deflecting surface coaxially disposed around said transverse surface so as to be contacted by such leakage fluids, and at least one outstanding projection coaxially disposed around said central opening and arranged on said transverse surface between said central opening and said rim for defining a concentric intermediate fluid-deflecting surface surrounding and facing said central opening and spatially disposed therearound at a uniform radius, said fluid-deflecting surfaces being cooperatively arranged to respectively divert leakage fluids that contact said fluid-deflecting surfaces laterally outwardly to form frustoconical envelopes of the diverted fluids for forcibly intercepting other leakage fluids moving along paths extending outside of said peripheral rim; and

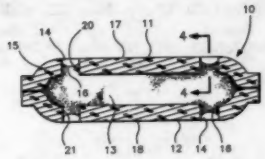
means on said circular member for securing said circular member on a pump shaft disposed within said central opening.

4,962,938

RUPTURABLE CHAMBER GASKET

Robert T. Cooper, 760 Eucaluptus Ave. #6, Vista, Calif. 92083

Filed Nov. 20, 1989, Ser. No. 438,796
Int. Cl.[5] F16J 15/02
U.S. Cl. 277—201 6 Claims



1. A gasket for sealing a pair of opposing surfaces comprising:

a. a first layer of gasket material;

b. a second layer of gasket material joined to the first layer and a sealant chamber formed between the first and second layer;

c. a plurality of first passageways through the first and second layers communicating with the sealant chamber;

d. a rupturable membrane sealing the first passageways;

e. a sealant within the sealant chamber; and

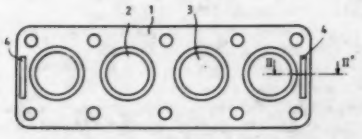
f. the sealant flowing from the sealant chamber, through the first passageways, rupturing the membranes and coating the opposing surfaces and a first surface of the first layer and a second surface of the second layer when the first and second layers are pressed together between the two opposing surfaces deforming the sealant chamber.

4,962,939

CYLINDER HEAD GASKET HAVING OVERLAYS IN END ZONES

Klaus Lönne; Klaus-Peter Majewski, both of Burscheid; Karl-Heinz Maus, Remscheid, and Franz-Josef Giesen, Odenthal, all of Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Mar. 12, 1985, Ser. No. 711,444
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1984, 3409952
Int. Cl.[5] F16J 15/10
U.S. Cl. 277—235 B 11 Claims



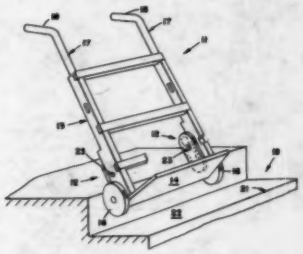
1. In an elongated cylinder head gasket including a mat of non-woven material having opposite faces each having two opposite end zones at opposite longitudinal ends of the gasket; a polymerized impregnating agent distributed within the material and an overlay on at least one of said faces; the improvement wherein said overlay comprises a hardened, pressure-resistant polymer material having a thickness; said overlay being sunken into said mat to a substantial extent of said thickness and being provided on at least one face in at least one said end zone.

4,962,940

HAND TRUCK UNDER-CARRIAGE FOR ENGAGING STAIRS OR THE LIKE

Casper Cuschera, 967 Industrial Pkwy. West, Hayward, Calif. 94544

Filed Feb. 6, 1989, Ser. No. 306,056
Int. Cl.[5] B62B 5/02
U.S. Cl. 280—5.22 10 Claims



8. Apparatus for facilitating travel of a hand truck on stairs or the like, said truck having a load supporting frame which has a base, a pair of ground wheels at the base of the frame and hand grip means for manually holding said frame in a semi-upright orientation during travel, said apparatus comprising:

a pair of track assemblies each being secured to said frame behind a separate one of said ground wheels and extending backward therefrom,

each of said track assemblies having a pair of spaced apart parallel flat side plates which have front and back ends and front and back and upper and lower edges, a plurality of rollers situated between said side plates and which are journalled to said side plates for rotation about fixed parallel axes of rotation that are normal to said side plates, said rollers including front and back end rollers located near said front and back ends of said side plates, a series of lower rollers located near the lower edges of said side plates and a series of upper rollers located hear the upper edges of said side plates, said rollers being positioned to define a continuous belt guideway in conjunction with said front and back and upper and lower edges of said side plates, and

wherein each of said track assemblies further includes an endless belt seated in said guideway along the entire length of the belt and having an inner surface that is in continuous contact with each of said rollers within said guideway and which is free of contact with said side plates, said belt having an outer surface that is outside said guideway along the entire length of the belt.

4,962,941

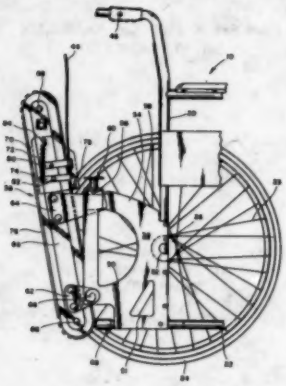
WHEELCHAIR APPARATUS

Steven N. Rembos, 790 S. Park Rd., Hollywood, Fla. 33021

Filed Mar. 22, 1989, Ser. No. 327,049
Int. Cl.[5] A61G 5/06; B62B 5/02, 9/02
U.S. Cl. 280—5.22 24 Claims

1. An apparatus for a wheelchair to assist the wheelchair and an occupant thereof to ascend or descend a stairway, comprising a pair of elongated track assemblies, each track assembly having a continuous tread rotatably spaced therearound such that the tread moves with respect to the track, each track assembly removably mounted to a mounting bracket, each said mounting bracket rigidly secured to at least one frame member of the wheelchair; each said track assembly mounted to each mounting bracket by a means for pivoting the track assembly with respect to the mounting bracket and by a means for adjusting the angle of the track assembly with respect to the

mounting bracket; each said track assembly positioned with respect to the rear wheels of the wheelchair such that as the



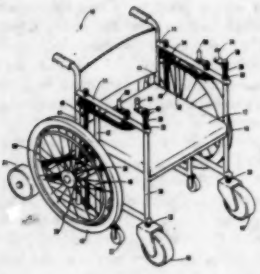
wheelchair is raised or lowered along a stairway having a series of individual stair steps, the track assemblies carry the weight of the wheelchair along the individual stair steps.

4,962,942

MINIMUM ENERGY CURB NEGOTIATING WHEELCHAIR

Ralph L. Barnett, Wilmette; Steven R. Schmid, Chicago, and Robert Kaplan, Skokie, all of Ill., assignors to Triodyne Inc., Niles, Ill.

Filed May 22, 1989, Ser. No. 354,804
Int. Cl.[5] B62B *5/02*
U.S. Cl. 280—5.28 **20 Claims**



1. In a wheelchair having a seat for an occupant secured to a frame, a pair of castered front wheels and a pair of primary rear wheels adapted to be revolved by the occupant to propel the wheelchair, the wheels normally having bearing surfaces lying in a common surface plane, the improvement comprising means to negotiate curbs and obstructions, comprising:

a. a first auxiliary support located solely between and spaced from said front and rear wheels, said first support being fixed in elevation relative to the seat at about said surface plane,

b. a second auxiliary support, separate from said first auxiliary support, located solely behind and spaced from said rear wheels, said second support being fixed in elevation relative to the seat at about said surface plane,

c. means to vertically translate said front wheels to lower said wheels beneath the fixed elevation of said first support, and

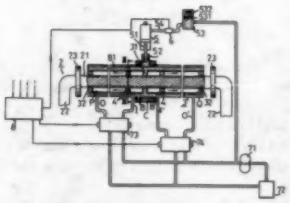
d. means to vertically translate said rear wheels to lower said wheels beneath the fixed elevation of said second support.

4,962,943

STABILIZER BAR UNIT THE TORSION TO THE WHEELS OF WHICH IS CAPABLE OF BEING AUTOMATICALLY ADJUSTED

Chien-Hung Lin, No. 150, Chung-Hsiao Rd., Chia-Li Chen, Tainan Hsien, Taiwan

Filed Oct. 30, 1989, Ser. No. 429,080
Int. Cl.[5] B60G *11/26*
U.S. Cl. 280—707 **1 Claim**



1. An automobile having a frame, two aligned wheels and a stabilizer bar unit associated with said wheels, each of said wheels including a control arm secured thereto, said stabilizer bar unit comprising:

a generally U-shaped stabilizer bar having a horizontal intermediate portion journalled on said frame, and two inclined end portions respectively connected to said control arms, said intermediate portion of said stabilizer bar having a splined outer surface;

a cylindrical sleeve having a splined inner surface, coaxially surrounding said intermediate portion of said stabilizer bar in such a manner that two sealed annular chambers are formed in two end portions of said sleeve;

two movable rings respectively and movably received within said two sealed annular chambers, each of said movable rings having a splined inner surface engaged with said splined outer surface of said intermediate portion of said stabilizer bar so as to prevent relative rotation between said movable ring and said intermediate portion of said stabilizer bar, and a splined outer surface engaged with said splined inner surface of said sleeve so as to prevent relative rotation between said movable ring and said sleeve;

a hydraulic cylinder, mounted pivotally on said frame at one end thereof, rotatable about a horizontal axis, having a piston rod extending through the other end of said hydraulic cylinder, said piston rod being connected pivotally to said cylindrical sleeve;

a hydraulic liquid reservoir disposed on said frame containing an amount of said liquid therein;

a conduit unit intercommunicating said hydraulic cylinder and said reservoir;

an automatically controlled switch, disposed on said conduit unit, capable of being automatically turned on to allow intercommunication between said reservoir and said hydraulic cylinder when said automobile advances at a constant speed along a generally straight path, capable of being automatically turned off to stop the intercommunication between said reservoir and said hydraulic cylinder when said automobile is steered, accelerated or braked; and

an automatic control system, capable of moving said movable rings outward when rotational speed of said wheels increases, and capable of moving said movable rings inward when said rotational speed of said wheels reduces;

whereby, the greater the distance between said movable

rings, the greater the potential torsion of said stabilizer bar to said wheels.

4,962,944

MANUALLY HEIGHT-ADJUSTABLE STEERING COLUMN OF POWER VEHICLE

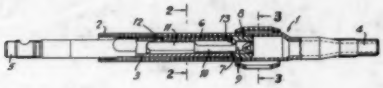
Carl-Heinz Reiche, and Hans Arnold, both of Lage, Fed. Rep. of Germany, assignors to Reiche & Co., Lippe, Fed. Rep. of Germany

Filed May 15, 1989, Ser. No. 353,075

Claims priority, application Fed. Rep. of Germany, May 19, 1988, 8806563

Int. Cl.[5] B62D *1/18*

U.S. Cl. 280—775 **8 Claims**



1. A manually height-adjustable steering column of power vehicle, comprising an inner tube and an outer tube together forming a telescopeable tubular element, said inner and outer tubes having an overlapping and displacement region, said outer tube having a multi-cornered cross-section; two sliding bushes arranged in said region at a distance from one another and having sliding surfaces associated with said outer tube in said region; a rotary bar extending inside said inner tube and having two end pieces one of which is connected with said inner tube, one of said sliding bushes being arranged in the vicinity of an end of said inner tube and being mounted on the other of said end pieces, the other of said sliding bushes being mounted on an cuter surface of said inner tube, said sliding surfaces of said one bush being offset relative to said sliding surfaces of said other sliding bush and orientable relative to sliding surfaces of said outer tube by a rotary deformation cf said rotary bar.

4,962,945

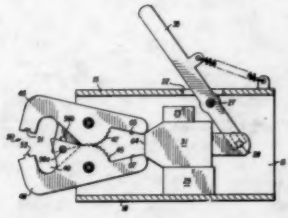
EASY HITCHING MECHANISM

Ray Vannoy, and Robert W. Miller, both of Corning, Ark., assignors to Scott Manatt, Corning, Ark.

Filed Jul. 3, 1989, Ser. No. 374,834

Int. Cl.[5] B60D *1/00*

U.S. Cl. 280—508 **9 Claims**



1. A hitching mechanism comprising:

(a) a jaw mechanism having:

(i) upper and lower pivoting jaws with mutually interacting guiding surfaces, said mutually interacting guiding surfaces each comprising an arcuate surface with gear teeth thereon, the gear teeth of said surfaces being enmeshed so that movements of one jaw result in corresponding movements of the other jaw;

(ii) each of said jaws having a forward portion and a rearward portion;

(iii) said forward portions combining to define an opening closeable by engagement of two forward surfaces, one surface on each of said jaws, said surfaces, when engaged, having an interconnection;

(iv) said rearward portion including a first portion on said upper jaw and a second surface on said lower jaw;

(b) locking means including a lock block movable in a direction toward said forward portions between said first and second surfaces when said forward surfaces are in engagement to lock said forward surfaces in engagement, thereby closing and locking said opening;

(c) said lower jaw being heavier than said upper jaw, whereby when said lock block is removed from between said first and second surfaces, the force of gravity causes said lower jaw to pivot to an open position, interaction of said guiding surfaces causing corresponding movements of said upper jaw.

4,962,946

SUSPENSION UNIT FOR ACTIVE SUSPENSION SYSTEM

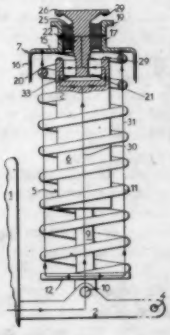
Peter G. Wright, Norfolk, England, assignor to Group Lotus P/C, Norfolk, England

Filed Apr. 7, 1989, Ser. No. 334,835

Claims priority, application United Kingdom, Apr. 8, 1988, 8808319

Int. Cl.[5] B60G *17/04*

U.S. Cl. 280—710 **17 Claims**



1. A suspension unit for a wheel supporting a vehicle body, said suspension unit comprising:

a wheel mounting member mounting said wheel and pivotably connected to said vehicle body,

an actuator operative between said mounting member and said vehicle body, said actuator comprising a cylinder, a double acting piston mounted in the cylinder and means to supply fluid under pressure to either side of the piston to move the piston in either direction along the cylinder, the cylinder and piston being operatively connected each to one of the mounting member and the vehicle body respectively,

transducer means in series with said actuator, said actuator and said transducer means providing a first load path between said mounting member and said vehicle body,

said transducer means being arranged to provide an electrical signal which varies in accordance with the load in said first load path,

resilient means in said first load path, and

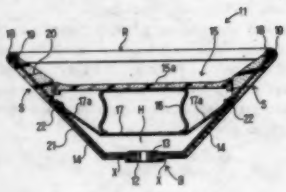
spring means operative between said mounting member and said vehicle body and providing a second load path in parallel with said first load path.

4,962,947

IMPACT ENERGY ABSORBING STEERING WHEEL

Atsushi Nagata, Nagoya, and Haruhiko Segawa, Aichi, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Nov. 15, 1988, Ser. No. 271,308
Claims priority, application Japan, Dec. 25, 1987, 62-198112
Int. Cl.[5] B62D *1/04*
U.S. Cl. 280—777 **13 Claims**



1. An impact energy absorbing steering wheel comprising:
a boss portion;
a ring portion disposed generally coaxially of said boss portion, but axially and radially spaced apart, said ring portion having an imaginary frontal plane disposed to be presented towards an automobile driver;
at least two generally radially extending spoke core members, each having a radially inner end secured to said boss portion and a radially outer end secured to said ring portion;
each of said spoke core members having a slanting portion extending from said ring portion toward said boss portion at an acute angle to a point intermediate the two radial ends thereof, and a second portion connecting said intermediate point to said boss portion;
a support member disposed between said boss and ring portions substantially parallel to said ring portion imaginary frontal plane and securely fixed to slanting portions of said spoke core members;
an impact energy absorber having an upper surface and being affixed to said support member; and
a pad disposed between said support member and said ring portion and having an upper surface extending substantially in parallel with said ring portion imaginary frontal plane;
each of said spoke core and support members being constructed of materials capable of plastic deformation and said support member and impact energy absorber being spaced from said boss portion whereby when an impact force acts on said ring portion at a non-perpendicular angle relative to said frontal plane, said ring portion, said impact energy absorber upper surface and pad upper surface all re-orient so as to extend substantially perpendicular to said impact force without interference from said boss portion.

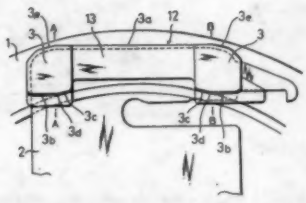
4,962,948

PASSIVE SEAT BELT SYSTEM INCORPORATING A GUIDE RAIL AND A SLIDE SHOE

Katsuyasu Ono, Yokohama, Japan, assignor to Nippon Seido Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1989, Ser. No. 314,094
Claims priority, application Japan, Feb. 24, 1988, 63-41025
Int. Cl.[5] B60R *22/06*
U.S. Cl. 280—804 **7 Claims**

1. A passive seat belt system comprising:
(a) a guide rail;
(b) a runner movable along said guide rail;
(c) a webbing connected to one end of said runner, said runner being movable between a first position in which said webbing may restrain a seated person and a second position in which said webbing may release the seated person; and
(d) a slide shoe mounted on said runner and contacting said guide rail so that said runner is slidable on said guide rail, and slide shoe having a top which is disposed on a side most remote from said one end of said runner in a direction perpendicular to the direction of movement of said runner and extends in the direction of movement of said runner, said slide shoe further having a pair of bottom projections on a side closer to said one end of said runner, wherein each of said bottom projections has a level portion extending substantially parallel to said top, an inner slope portion extending from said level portion in such a direction that an imaginary extension of said inner slope portion of one of the bottom projections crosses that of the inner slope portion of the other bottom projection on a side of said top, and a corner portion at which said level portion and said inner slope portion meet, wherein said level portion is slightly inclined, with respect to the direction of movement of said runner, in such a direction that an imaginary extension of one level portion on a side closer to said one end of said runner.

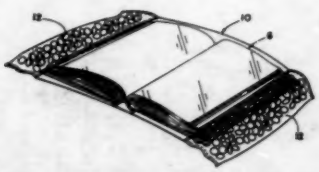


4,962,949

BOOK BLANKET

Mary Lou Gibbs, 4115 E. Zion, Tulsa, Okla. 74115

Filed Jul. 10, 1989, Ser. No. 378,691
Int. Cl.[5] B42D *3/00*
U.S. Cl. 281—35 **7 Claims**



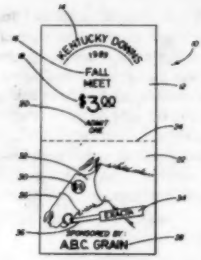
1. A blanket for covering a printed document of the type having a vertical height, vertical side edges and a horizontal dimension comprising an elongated sheet of flexible transparent material having a vertical height substantially equal to the vertical height of the document to be covered and a horizontal length substantially equal to the horizontal dimension of the document to be covered, the blanket having opposite horizontal ends and vertical pouches at the opposite horizontal ends of the blanket adapted to be positioned adjacent to the vertical side edges of the document to be covered, the pouches being filled with a material constituting weights.

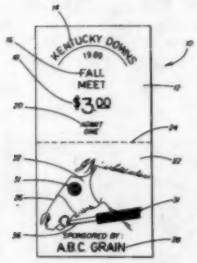
4,962,950

APPARATUS FOR INCREASING ATTENDANCE AT PARIMUTUEL EVENTS

Joseph S. Champion, P.O. Box 13216, Lexington, Ky. 40583

Filed Oct. 13, 1989, Ser. No. 421,193
Int. Cl.[5] B72D *15/00*
U.S. Cl. 283—67 **8 Claims**





1. An admission ticket for a parimutuel event designed to increase both betting interest and attendance by the public, comprising:

a single sheet including a pass stub and a wagering stub separated by a fold line, said pass stub to gain entrance to said parimutuel event and said wagering stub to be exchanged for a bet at said parimutuel event;

wager indicia printed on said wagering stub identifying a wager which may be made by a patron;

a first removable opaque portion overlaying and concealing said wager indicia;

indicia means printed on said wagering stub for limiting the use of said wager by a patron at said parimutuel event; and

a second removable opaque portion overlying and concealing said indicia means for limiting the use of said wager.

4,962,951

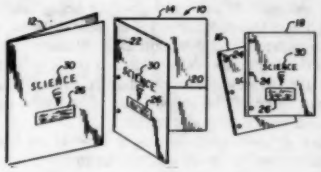
BOOK COVER AND NOTE KEEPER SYSTEM

Veronica A. Mechesney, 1860 Jancey St., Pittsburgh, Pa. 15206

Continuation of Ser. No. 184,182, Apr. 21, 1988, abandoned.
This application Feb. 28, 1990, Ser. No. 488,529
Int. Cl.[5] B42D *15/00, 3/00, 3/04*; B42F *21/00*
U.S. Cl. 283—114 **22 Claims**

1. A set of materials for correlating information relating to a common subject matter, said set of materials including at least one book cover and at least one note keeper, and wherein said book cover and said note keeper each having a common subject matter indicia on its outer surface such that a book covered by the book cover and related materials collected and retained in the note keeper can be directly correlated with each other by said common subject matter indicia, said set of materials comprising,

a sheet of protective book covering material for covering the bound covers of a printed book, said sheet of book covering material, in use, being affixed to and enclosing said bound covers of said book and having preaffixed on its outer surface prominent indicia of the subject matter of said book, said indicia by reason of graphics, color, or structure, separately or in combination, being susceptible of easy perception and subject identification, and



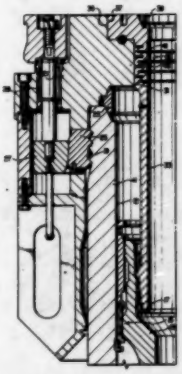
a companion note keeper comprising information receiving and storage means for use with said book for collecting and retaining information relating to the subject matter of said book, said information receiving and storage means being essentially free of text and having preaffixed on its outer surface essentially the same indicia of said subject matter of said book as that carried on the outer surface of said book covering material.

4,962,952

PRESSURE TUBE WITH DEFLECTING SECTION

Joseph W. Pallini, Jr., Tomball, Tex.; Norman Brammer, Fyvie, Scotland, and Glenn M. Wald, Spring, Tex., assignors to Vetco Gray Inc., Houston, Tex.

Filed Mar. 29, 1989, Ser. No. 329,980
Int. Cl.[5] E21B *19/10*; F16L *27/00, 51/00*
U.S. Cl. 285—24 **4 Claims**



4. In a first member mounted to a second member, both members having substantially coaxial bores which are axially spaced from each other, an improved means for connecting the bores, comprising in combination:

a metal tube having an inner wall, an outer wall, a first end and a second end;

means on the first end of the tube for connecting the first end of the tube to the first member with the interior of the tube in sealing communication with the bore of the first member;

a conical shoulder in the second member;

the second end of the tube extending into the second member, with the outer wall of the tube sealingly engaging the bore of the second member and with the second end bearing against the shoulder in the second member;

a deflecting section in the tube having a plurality of circumferential inner grooves extending from the inner wall outward a selected distance;

the deflecting section having a plurality of circumferential outer grooves extending from the outer wall inward, the inner grooves and outer grooves alternating from each other in an axial direction;

each of the inner and outer grooves having an axial thickness, and each of the inner grooves being axially spaced from one of the outer grooves an axial distance, said axial thickness being less than said axial distance;

the length of the tube being selected so as to axially compress the deflecting section slightly to provide an axial preload force of the second end of the tube against the shoulder of the second member;

the outer grooves each having a base at an inner radial distance from the inner wall of the tube;

the inner grooves each having a base at an outer radial distance from the outer wall of the tube;

said inner radial distance and said outer radial distance each being greater than said axial thickness of the grooves;

the base of each of the inner grooves having a diameter, the bore of the second member immediately above the shoulder having an inner diameter that is less than the diameter of the base of each inner groove, so that pressure within the tube urges the second end of the tube more tightly against the shoulder; and

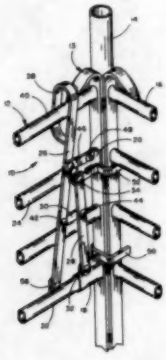
the base of each of the outer grooves having a diameter that is less than said inner diameter of the bore of the second member.

4,962,953

ANIMAL GATE LATCH MECHANISM

William D. Priefert, Mt. Pleasant, Tex., assignor to Priefert Mfg. Co., Inc., Mt. Pleasant, Tex.

Filed Jan. 31, 1990, Ser. No. 472,877
Int. Cl.[5] E05C 9/02
U.S. Cl. 292—36 **6 Claims**



1. A gate latch mechanism for releasably latching the free end of swingable gate to an upright gate post, comprising:

(a) an upper latch unit movably mounted on the gate for horizontal movement from a gate opening position to a gate latching position with the post;

(b) a lower unit moveably mounted on the gate for horizontal movement from a gate opening position to a gate latching position;

(c) an upright link movably connected at the upper end thereof to said upper latch unit and at the lower end thereof to said lower latch unit;

(d) an upright actuating arm pivotally attached at the lower end thereof to the gate at a position adjacent said lower latch unit; and

(e) a horizontal link pivotally interconnected to said actuating arm and to said upright link intermediate the ends thereof;

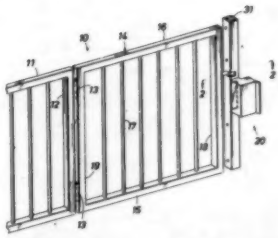
(f) wherein said actuating arm and said upright link and said horizontal link are configured whereby on continuous pivotal movement of said actuating arm in one direction about the lower end thereof said upper and lower latch units are successively moved from said gate opening position therefor to said gate latching position therefor and on continuous pivotal movement of said actuating arm in the opposite direction said upper and lower latch units are successively moved from said gate latching positions therefor to said gate opening positions therefor.

4,962,954

BURGLAR BAR SYSTEM INCORPORATING A HAND OPERATED LATCH MECHANISM OPERABLE FROM THE BUILDING INTERIOR

Barry Ross, 1910 Turner, Houston, Tex. 77093

Filed Apr. 6, 1989, Ser. No. 334,210
Int. Cl.[5] E05C 1/16
U.S. Cl. 292—175 **10 Claims**



1. A burglar bar system for restricting entry comprising:

(a) a gate for blocking entry including:

(i) protecting bars for an opening;

(ii) hinges securely attached relative to an opening being protected adjacent an interior area, where said hinges allow inward rotation of said gate;

(iii) a latch bar protruding from said gate for cooperatively preventing rotation;

(b) a frame member independent of said gate and securely attached adjacent said opening and wherein said frame member supports a receiving means for said latch bar, said receiving means restricting rotation of said gate by receiving said latch bar;

(c) a lock means supported by said frame member for locking said gate and wherein said lock means includes

(i) a housing mounted on the face of said frame member facing said interior area to restrict hand manipulation of said lock means to persons in the area to be protected by said burglar bar system and wherein said housing has an opening remote from said gate permitting access to a second opening in said frame member by a person's hand entering said remote housing opening in a plane parallel to said gate; and

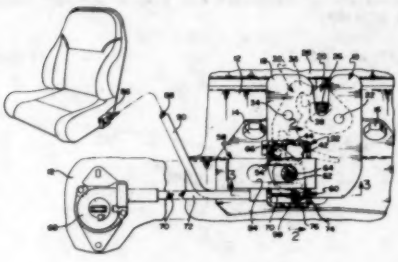
(ii) a lock member within said frame member to engage and restrict said latch bar and wherein said lock member is accessed only by a person's hand entering said opening in said housing and also entering said second opening.

4,962,955

DECK LID LATCH AND REMOTE RELEASE

Randy Ferrara, Mt. Clemens; Carl D. May, Farmington Hills, and Ian J. Dow, Royal Oak, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 16, 1989, Ser. No. 422,398
Int. Cl.[5] E05C *3/26*
U.S. Cl. 292—216 6 Claims



1. In a vehicle having a luggage compartment lid openable upon release of a latch, and a release handle mounted in the operator compartment and connected to the latch by a cable for releasing the latch upon operator actuation of the release handle, the improvement comprising:

a drive member rotatably mounted on the latch and operable to release the latch,

an actuator member rotatably mounted and being rotatable by the cable upon operator actuation of the release handle,

gear teeth acting between the actuator member and the drive member so that rotation of the actuator member rotates the drive member,

and shift means located inside the luggage compartment and operable to selectively shift one of the members relative the other member to disengage the gear teeth acting therebetween so that operator actuation of the release handle is disconnected from the latch.

4,962,956

WASTE COLLECTION DEVICE

Robert D. Scripter, 3702 E. Miami, Phoenix, Ariz. 85040

Filed Feb. 2, 1990, Ser. No. 473,930
Int. Cl.[5] A01K *29/00*; E01H *1/12*
U.S. Cl. 294—1.4 4 Claims

1. A waste collection device for use with a disposable, flexible merchandise bag of the type having an opening defined by an edge, said device comprising:

(a) an elongate generally axially extending handle having an upper and lower end, said lower end defining a recess having a wall;

(b) a flexible frame having a base and opposite sides which sides terminate at parallel projections, said projections engaged in said recess with said wall being at least partially flattened to engage and secure said frame projections therein;

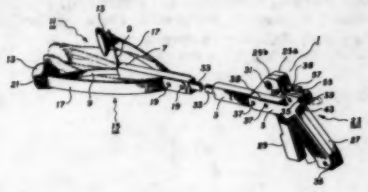
(c) said wall defining bag retaining means, said bag retaining means comprising a first large aperture connected to a smaller aperture, whereby an edge of said bag may be engaged to at least a part of said frame with the bag positioned in said frame whereby a portion of the edge of the bag can be passed through said bag retaining means and frictionally engaged therein for temporarily securing said bag to said frame.

4,962,957

PICKUP TOOL WITH POSITIONAL LOCKING DEVICE

Arthur Traber, 888 Rancheros Dr., San Marcos, Calif. 92069

Filed Oct. 17, 1989, Ser. No. 422,753
Int. Cl.[5] B25J *1/00*
U.S. Cl. 294—19.1 13 Claims



1. In a single-hand actuated pick-up tool of the type comprising an elongated shaft terminating at spaced-apart upper and lower ends, a pair of spaced-apart, pick-up fingers extending from said lower end of said shaft including first means for biasing said fingers apart to a first, fully-opened position, and second means, including a handle with a finger-actuable trigger at said upper end, said trigger biased apart from said handle, for drawing said fingers together to a second, fully-closed position, as said trigger is squeezed against said handle, the improvement comprising:

(a) an arm extending from said trigger adapted for reciprocal motion as a function of movement of said trigger;

(b) at least one notch formed in said arm adapted for engagement with a stop in said handle;

(c) bias means urging said arm into sliding contact with said stop as said trigger is moved; and,

(d) a lever pivotally mounted for movement between a first position, that permits said bias means to retain said arm in contact with said stop, for positioning said fingers in fixed configurations less than said first, fully-opened position, and a second position, that overcomes said bias means and moves said arm to a position spaced-apart from said stop to allow free, unhampered movement of said fingers from said first, fully-opened position to said second, fully-closed position as a function of said finger-actuable trigger.

4,962,958

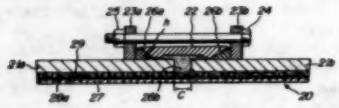
LINING LAMINATE FOR A PIPELINE

Norio Takei, 19-24, Mita 4-Chome, Minato-Ku, Tokyo, Japan

Filed Apr. 6, 1989, Ser. No. 334,283
Claims priority, application Japan, Jun. 3, 1988, 63-135409
Int. Cl.[5] F16L *09/14*
U.S. Cl. 285—55 2 Claims

1. A line pipe comprising two pipes disposed in end-to-end relationship and connected to each other through an expansion joint, there being an annular space between adjacent ends of

said two pipes, a lining tube secured inside said pipes by a pressure sensitive adhesive, a woven fabric impregnated with liquid plasticizer containing a rust preventive agent disposed between said pressure sensitive adhesive and said adjacent ends



of said pipes, and a pressure sensitive adhesive in said annular space and said lining tube, pressure sensitive adhesive and woven impregnated fabric all extending continuously from one pipe to the other across said gap.

4,962,959

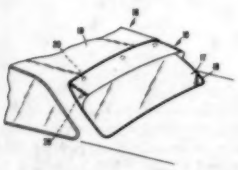
REAR WINDOW SUNVISOR

Rodney E. Herwill, Brookfield, and Gregory M. Herwill, Kenmore, both of Australia, assignors to Cyclamen Services Proprietary, Ltd., Salisbury, Australia

Filed Jan. 11, 1990, Ser. No. 463,229

Int. Cl.[5] B60J *3/00*

U.S. Cl. 296—95.1 **16 Claims**



1. A visor for mounting on the rear window of a vehicle, the window having an upper portion and opposed side portions, the visor comprising:

a body member having a first leading edge for positioning against the window at the upper portion thereof, a trailing edge spaced from said leading edge, and a pair of opposed transverse ends, said body member being transversely elongated to span substantially the rear window between the opposed side portions;

depending support means connected to said body member transverse ends for spacing said trailing edge from said window; and

means associated with said body member and said support means for mounting the visor directly to the window,

wherein the projection of the vehicle roof portion adjacent the upper window portion defines a plane, and wherein said spaced trailing edge lies in a second plane substantially coplanar with the defined plane,

wherein said depending support means includes a pair of side members having respective second and third leading edges for positioning against the window,

wherein said mounting means includes said body member and said side members each having flange portions disposed along said first, second, and third leading edges, respectively, said flange portions having respective flange surfaces configured to seat on the window, and

wherein said mounting means further includes adhesive strip means positioned along said respective flange surfaces.

4,962,960

ARRANGEMENT FOR FIXING A TOP OF A MOTOR VEHICLE

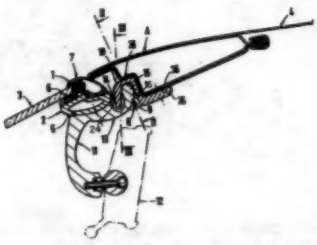
Willi Wurl, Niefern-Oeschelbronn; Benjamin Dimson, Tiefenbronn-Muehlhausen, and Rainer Uerlings, Rutesheim, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 230,960, Aug. 11, 1988, abandoned. This application Feb. 13, 1990, Ser. No. 479,200

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1987, 3728267

Int. Cl.[5] B60J *7/185*

U.S. Cl. 296—120.1 **16 Claims**



1. An arrangement for longitudinally and laterally positionally fixing a top of a vehicle of the type having windshield frame means, comprising a laterally extending header means, and an interior rearview mirror supported adjacent the header means, said positionally fixing arrangement

a first separate member detachable and attachable from and to the laterally extending header means of the windshield frame means, said first member being integrally formed and exhibiting an upwardly facing first positioning contour and a downwardly extending leg for carrying a vehicle interior rearview mirror;

and a second member fixedly attachable to a vehicle top, said second member exhibiting a downwardly facing second positioning contour having a substantially hollow cavity provided with side walls, an end wall opposite the second downwardly facing contour and a top portion and wherein said cavity is configured to mate with the upwardly facing positioning contour of the first member to longitudinally and laterally fix the position of the top with respect to the windshield frame means by engagement of the first member with the walls and second downwardly facing contour.

4,962,961

AUTOMOBILE FRONT BODY STRUCTURE

Keizo Ito, Hiroshima, and Mitsuyuki Shoda, Aki, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 23, 1989, Ser. No. 327,775

Claims priority, application Japan, Mar. 23, 1988, 63-67280

Int. Cl.[5] B62D *21/00*

U.S. Cl. 296—192 **4 Claims**

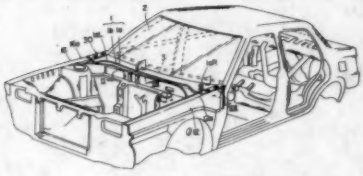
1. An automobile front body structure comprising:

a dashboard lower panel adapted to be positioned below a front windshield and to extend laterally across an automobile body so as separate an engine room and a passenger compartment;

an elongated box-shaped cowl box rigidly mounted to an upper portion of said dashboard lower panel and adapted to extend laterally across the automobile body between sidewalls thereof, said cowl box including a horizontal elongated bottom panel extending along its length and having an opening formed therein between the interior of said cowl box and the passenger compartment;

means for rigidly securing each end of said cowl box to a respective one of the sidewalls of the automobile body;

an elongated substantially closed hollow windshield support beam defined in an upper portion of said cowl box along the length thereof and adapted to support a bottom edge of the windshield, said windshield support beam including an elongated bottom wall along the length thereof substantially separating the interior of said windshield support beam from the portion of the interior of said cowl box outside said windshield support beam, said bottom wall of said windshield support beam having an opening formed



therein at a location adjacent one end thereof and a vent opening formed therein communicating between said interior of said windshield support beam and said portion of said interior of said cowl box outside said windshield support beam; and

means, mounted between said bottom wall of said windshield support beam and said bottom panel of said cowl box, for defining a communication passage between said opening formed in said bottom wall of said windshield support beam and said opening formed in said bottom panel of said cowl box.

4,962,962

PIECE OF SEATING FURNITURE

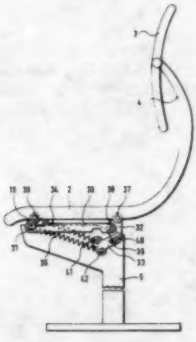
Rainer Machate, Biebertal; Robert Vonhausen, Giessen, and E. Hansen, St. Margrethen, all of Fed. Rep. of Germany, assignors to VOKO Franz Vogt & Co., Pohlheim, Fed. Rep. of Germany

Filed Jan. 7, 1988, Ser. No. 142,041

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1987, 3700447

Int. Cl.[5] A47C *3/00*

U.S. Cl. 297—300 **21 Claims**



1. A piece of seating furniture having a seat carrier, a seat part articulated to the seat carrier, and a back part supported on a back carrier to provide a supporting force, the supporting force provided by the back part being adjusted in response to a weight applied to the seat part, characterized in that the seat part is mounted on the seat carrier for vertical adjustment by means of a parallelogram linkage against the force of a spring element, in that the force of the spring element is adjusted in response to the vertical adjustment of the seat part, and in that the back carrier is mounted for pivotal motion with respect to the seat carrier, a pivoting motion of the back carrier taking place against the force of the spring element, the vertical adjustment of the seat part adjusting the supporting force provided by the back part.

4,962,963

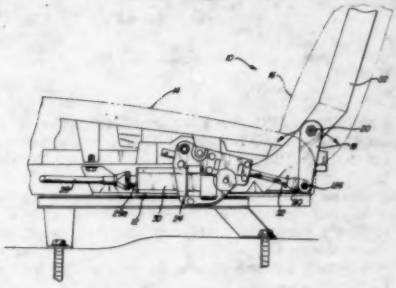
POWER LINEAR SEAT RECLINER

David L. Robinson, Sterling Heights, Mich., assignor to Fisher Dynamics Corporation, St. Clair Shores, Mich.

Filed Jul. 24, 1989, Ser. No. 384,161

Int. Cl.[5] A47C *1/024*; B60N *1/06*

U.S. Cl. 297—361 **22 Claims**



1. A power linear seat recliner apparatus for controllably adjusting the angular position of a seat back relative to a seat, said apparatus being responsive to remote actuation by an operator, comprising:

a first elongated rod having one end connectable to said seat back;

a second elongated rod having one end connectable to said seat back, said second rod being positioned parallel to and spaced apart from said first elongated rod;

a first recliner mechanism connectable to said seat and receiving said first elongated rod, said first recliner mechanism including an integrally mounted motor having a rotatable drive cable axially disposed therein, and first transmission means interconnected to said drive cable for changing the rotational motion of said drive cable generated by actuation of said motor into linear motion of said first elongated rod;

a second recliner mechanism connectable to said seat and receiving said second elongated rod, said second recliner mechanism comprising second transmission means for changing the rotational motion of said drive cable generated by actuation of said motor into linear motion of said second elongated rod; and

means connecting said first and second recliner mechanisms for transmitting rotational motion of said drive cable to said second transmission means.

4,962,964

FLEXIBLE PLASTIC SEATING SHELL

Warren Snodgrass, 223 Woodland Rd., Kentfield, Calif. 94904

Filed Nov. 3, 1988, Ser. No. 266,523

Int. Cl.[5] A47C *5/12, 3/12*

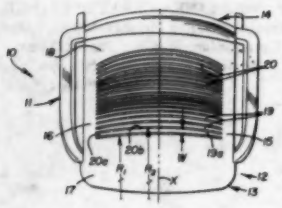
U.S. Cl. 297—457 **16 Claims**

1. A seating shell comprising:

a seat, disposed on a central longitudinal axis thereof, having solid, semi-rigid and laterally spaced side borders extending in the direction of said axis and front and back borders

extending transversely between said side borders to form a frame structure for said seat;

a plurality of elongated closely spaced arcuate slots, said slots having their lengths extending between and terminating at said side borders and being formed through said seat to define a plurality of closely spaced and flexible web means, each of said slots defining an arc of curvature that is concave when viewed from the front border of said seat, and each of said slots extending downwardly and rearwardly towards the back border of said seat at an acute angle, relative to a horizontal plane containing said axis, selected from the approximate range of from 30° to 60 °; and



said web means having their lengths extending and attached in suspended relationship between said side borders, with at least a substantial number of said web means having varied widths for providing varied degrees of flex and a substantially uniform distribution of a seating load when such load is imposed on said seat.

4,962,965

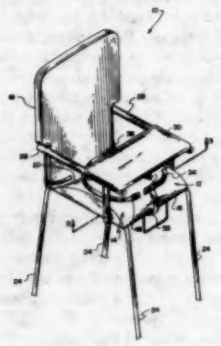
SEAT BELT ASSEMBLY FOR HIGH CHAIRS

Richard W. Glover, Troy, Ohio, assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.

Filed Sep. 19, 1989, Ser. No. 409,370

Int. Cl.[5] A47D *15/00*

U.S. Cl. 297—467 **4 Claims**



1. A high chair comprising:

a seat with a back component and a bottom component for receiving a child thereon;

a plurality of tubes for strengthening the seat and extending on opposite sides of the seat for forming arm rests;

a plurality of legs for supporting the seat at a proper height;

a tray removably positioned on the arm rests in front of the seat above the bottom component; and

a seat belt assembly comprising a pair of generally horizontally extending waist straps each coupled at its remote end to a portion of a high chair seat with a buckle part at its front end, a crotch strap permanently secured to a front central extent of the seat portion and having a free front end, and a main buckle permanently attached to the free end of the crotch strap with the main buckle also having a pair of attachment mechanisms for removably receiving the buckle parts of the ends of the waist straps and operator controlled means to individually separate each buckle part at the waist strap free end from the main buckle.

4,962,966

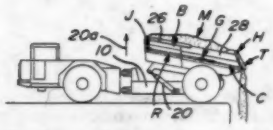
AUTOMATIC TAILGATE ASSEMBLY

Hermann K. Bumueller, 229 Westgate, Rosemere, Quebec, Canada J7A 2E8

Filed Nov. 1, 1989, Ser. No. 430,111

Int. Cl.[5] B60P *1/00*

U.S. Cl. 298—23 R **10 Claims**



1. A tailgate assembly for a dump box of the type comprising at least a first front section and a second rear section adapted for telescopic movement one with respect to the other between an expanded and a collapsed position thereof, motor means being provided for controlling the telescopic movement, the dump box being adapted for pivoting between a lowered and a raised position thereof; said tailgate assembly comprising at least a tailgate means and a tailgate operating means, said tailgate means including a tailgate adapted to be hingedly mounted to a rear end part of the second section of the dump box for pivoting between an open and a closed position thereof with respect to the dump box, said tailgate operating means being adapted for connection at front and rear ends thereof respectively to the first section of the dump box and to said tailgate, said tailgate operating means being adapted for allowing said tailgate to pivot between said open and closed positions thereof a limited angle dependent on a relative position of the first and second sections.

4,962,967

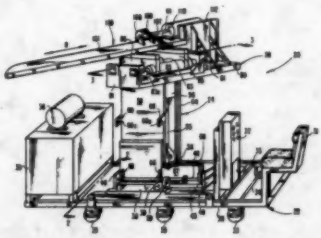
STONE SLOTTING MACHINE

John H. Hinkle, 2225 Rockport Rd., Bloomington, Ind. 47401

Filed May 22, 1989, Ser. No. 355,432

Int. Cl.[5] F21C *31/04, 41/12*

U.S. Cl. 299—41 **11 Claims**



10. A stone slotting machine comprising:

a main frame defining a horizontal plane and including means for moving said main frame along the ground;

a reciprocating arbor cutting blade adapted for cutting a slot in stone;

means between said main frame and said arbor cutting blade for movably supporting said reciprocating arbor cutting blade on said main frame including;

means for tilting said arbor cutting blade relative to said main frame about a first axis; and

means for pivoting said arbor cutting blade relative to said main frame about a second axis,

wherein said first axis is parallel with said horizontal plane, and said second axis is perpendicular to and rotatable about said first axis.

4,962,968

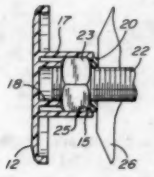
SKATEBOARD HUBCAP RETROFIT ASSEMBLY

Neil Caplin, 4215 Citrus Cir., Yorba Linda, Calif. 92686

Filed Jun. 5, 1989, Ser. No. 361,289

Int. Cl.[5] B60B *7/06*

U.S. Cl. 301—108 SC **4 Claims**



1. A skateboard assembly for covering a normally exposed axle nut and wheel bearings of a skateboard wheel comprising:

(a) a shield sized to cover the exposed skateboard axle nut and wheel bearings;

(b) an axle receiving column, said axle receiving column being hexagonal in cross-sectional shape and connected to a first side of said shield and extending therefrom, said column having a central cavity, the inner surface of said cavity being formed for mating engagement about the axle nut;

(c) a cylindrical strip connected to the first side of said first shield and extending therefrom, said cylindrical stop being affected to limit the axial movement of said shield toward the axle nut;

(d) at least one dentent formed on said cavity inner surface for locking said axle receiving column in place about the axle nut to limit the axial movement of said shield away from the axle nut; and

(e) a spacer disposed intermediate the axle nut and the wheel bearings, said spacer having an outer diameter less than that of the axle nut, for providing a relief region for receiving said dentent.

4,962,969

ADAPTIVE CONTROLLER FOR REGENERATIVE AND FRICTION BRAKING SYSTEM

Roy I. Davis, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1988, Ser. No. 251,421

Int. Cl.[5] B60L *7/10*

U.S. Cl. 303—3 **19 Claims**

1. A regenerative and friction braking system for a vehicle having one or more roadwheels driven by an electric traction motor, comprising:

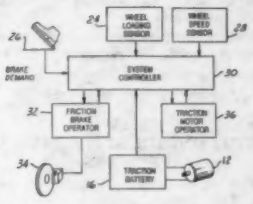
driver responsive means for producing a brake demand signal having a magnitude corresponding to the level of braking force selected by the driver;

friction braking means operatively connected with one or more roadwheels of said vehicle;

regenerative braking means operatively connected with said electric traction motor; and

control means for operating said friction braking means and said regenerative braking means, with said control means comprising:

means for periodically determining the maximum brake torques which may be developed by both of said braking means without causing skidding or slipping of said road-



wheels, said means including means for determining the coefficient of friction between at least one of said roadwheels and the surface upon which said vehicle is being operated; and

means for calculating brake commands for said friction and regenerative braking means based upon said brake demand signal and upon said determining maximum brake torques, such that said determined maximum brake torques will not be exceeded.

4,962,970

ANTI-LOCK BRAKING SYSTEM

Wolf-Dieter Jonner, Beilstein-Schmidhausen; Volker Braschel, Heilbronn; Dieter Roller, Valhingen.Enz, and Herbert Demel, Möglingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

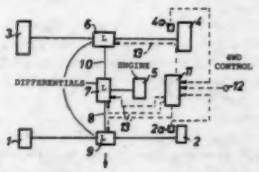
PCT No. PCT/EP87/00415, § 371 Date Apr. 28, 1989, § 102(e) Date Apr. 28, 1989, PCT Pub. No. WO88/03490, PCT Pub. Date May 19, 1988

PCT Filed Jul. 30, 1987, Ser. No. 350,732

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1986, 3638665

Int. Cl.[5] B60K *23/08*; B60T *8/66, 8/32*

U.S. Cl. 303—100 **6 Claims**



1. An anti-lock braking system for a motor vehicle that has four road wheels, means for braking each wheel, means for driving each wheel, and means for shifting between two-wheel and four-wheel drive, said shifting means incorporating a longitudinal differential between the front wheel drive shaft and the rear wheel drive shaft and a central lock for locking said longitudinal differential so as to drive said front and rear drive shafts at the same speed, said anti-lock braking system comprising:

(a) at least one wheel speed sensor associated with one or more wheels for producing a signal representative of the respective wheel speed of said one or more wheel;

(b) an evaluation circuit, responsive to the wheel speed

signal of each wheel speed sensor, for producing a brake control signal for at least one wheel, said evaluation circuit including:

(1) means, responsive to said shifting means, for producing a speed reference value which depends upon whether the central lock is engaged or disengaged, said reference value being reduced when the central lock is engaged; and

reference value, for producing said brake control signal for at least one wheel in dependence upon the relative magnitudes of the represented wheel speed and said reference value; and

(c) at least one brake pressure control unit, responsive to said brake control signal, for regulating the brake pressure applied to said at least one wheel.

4,962,971

ANTI-SKID CONTROL SYSTEM FOR MOTOR VEHICLES

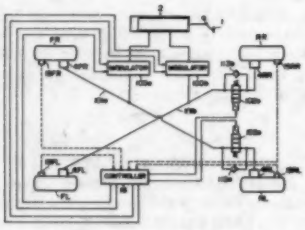
Katsuya Miyake, Ageo, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 273,219

Claims priority, application Japan, Nov. 19, 1987, 62-290675

Int. Cl.[5] B60T *8/26, 8/02*

U.S. Cl. 303—100 **1 Claim**



1. An anti-skid control system for a motor vehicle having front righthand, rear lefthand, front lefthand and rear righthand wheels and equipped with an X-type two-channel piping brake apparatus wherein one of the two channels is associated with the front righthand and rear lefthand wheels while the other channel is associated with the front lefthand and rear righthand wheels, means for controlling said two channels independently of each other, said anti-skid control system comprising;

first valve means provided in a piping connecting a rear wheel cylinder to a modulator for increasing and reducing brake fluid pressure in a respective one of said two channels, said valve means being arranged to be closed only when the rear wheel tends to be locked earlier than the front wheel; and

check valve means provided in parallel with said first valve means, said check valve means being arranged to only permit the brake pressure fluid to flow from said rear wheel cylinder to said modulator, said first valve means comprising a normally open solenoid valve adapted to be opened and closed in response to a signal derived from a control circuit for controlling said modulator, said control circuit including a select-low circuit for selecting the lower one of the front and rear wheel speeds in said respective one of the two channels and being arranged to control said modulator on the basis of the wheel speed selected by said select-low circuit, said control circuit further including a subtracter for subtracting the rear wheel speed from the front wheel speed in said respective one of the two channels so as to provide an output representing the difference between the two wheel speeds; a comparator for comparing the output of said subtracter with an amount corresponding to a predetermined speed difference ΔV and providing an output pulse when the output of said subtracter exceeds said amount corresponding to said predetermined speed difference ΔV; and a flip-flop circuit arranged to be reset by the output pulse of said comparator and reset by a brake fluid pressure reducing signal supplied from said control circuit to said modulator; said first valve means being controlled in opening and closing by the output of said flip-flop circuit.

4,962,972

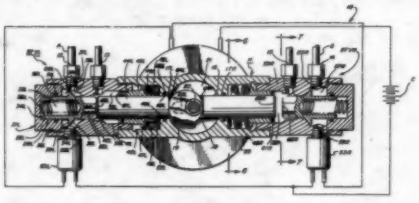
CYCLING AUTOMATIC WHEEL LOCKUP CONTROL APPARATUS

Joseph Pizzo, 12635 Main St., Apt. 217, Garden Grove, Calif. 92640

Filed Oct. 24, 1988, Ser. No. 261,497

Int. Cl.[5] B60T *8/02*

U.S. Cl. 303—116 **18 Claims**



1. An apparatus for cyclically applying hydraulic pressure to two separate sets of vehicle wheel brakes supplied by primary and secondary master cylinder pistons, respectively, said pressure being applied substantially alternatively but with some overlap to said separate sets of brakes, said apparatus comprising;

a. means for sensing the hydraulic pressure produced by said primary and secondary master cylinder pistons,

b. first valve means interposed between said primary master cylinder pressure line and said primary brake line,

c. second valve means interposed between said secondary master cylinder pressure line and said secondary brake line,

d. valve actuating means responsive to said pressure sensing means in alternatively and cyclically fully opening and fully closing said first and second valve means when said pressure provided by one of said primary and secondary master cylinder pistons exceeds a predetermined threshold, said valve actuating means opening each of said first and second valve means for a period T1 slightly greater than 180 degrees out of a 360 -degree cycle, thereby causing each of said first and second valve means to be exclusively open for a period T2 slightly less than 180 degrees, equal to the difference between 360 degrees and T1, whereby either said primary or secondary brakes may be locked up for a period T2, and causing both of said first and second valve means to be open for an overlap period T3 equal to the difference between T1 and T2, whereby both primary and secondary brakes may be locked up for said period T3.

4,962,973

PORTABLE RECYCLE CONTAINER ASSEMBLY

Bruce M. Allmon, Rte. 2, Box 347-H, Marthasville, Mo. 63357

Filed Oct. 3, 1989, Ser. No. 416,592

Int. Cl.[5] A47B *88/00*

U.S. Cl. 312—325 **22 Claims**

1. A container apparatus comprising:

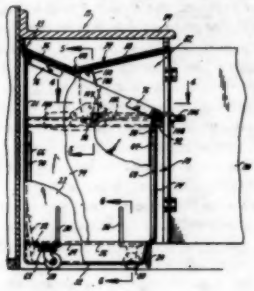
a container having at least one generally vertical side wall and an interconnected bottom defining an interior of the container, the container being substantially fluid tight and having an opening at the container top;

a lid covering the top opening of the container and being

adapted to be raised and lowered to open and close the top opening, respectively;

a first door, the container being adapted to be inserted into and removed from an enclosed area, the enclosed area being selectively opened and enclosed by the first door;

a pivot arm adapted to be pivoted about a stationary pivot point relative to the container, the pivot point of the pivot arm being fixed stationary relative to the enclosed area and the door, enabling the pivot arm to pivot relative to



the area and the door; and

a link member connected to the pivot arm and adapted to cause oscillating movement of the pivot arm about the pivot point in response to reciprocating movement of the link member, the link member having a first end connected to the pivot arm and a second end connected to the door, whereby the link member will reciprocate and cause the pivot arm to oscillate about the pivot point and open and close the lid of the container in response to opening and closing of the door.

4,962,974

SLIDE FOR DRAWERS

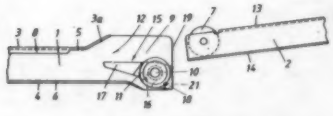
Alexander Fitz, Schaan, Liechtenstein, assignor to Anstalt Agenda, Vaduz, Liechtenstein

Filed Mar. 20, 1989, Ser. No. 326,372

Claims priority, application Switzerland, Mar. 23, 1988, 1093/88

Int. Cl.[5] A47B *88/00*

U.S. Cl. 312—333 **9 Claims**



1. A slide for drawers, component bases and other components that are slidable with respect to a frame, having guides on said frame and guides on said slidable component,

said slidable component guides having rollers mounted thereon and being formed by tracks with running surfaces for rollers mounted on said frame guides,

said frame guides having upper and lower running surfaces and rollers mounted on axles in front end regions of said frame guides,

said upper and lower running surfaces being spaced apart in said front end regions to provide insertion apertures for insertion of said slidable component guides,

said frame guides having swivel catch means in the region of at least one of said insertion apertures,

said swivel catch means being arranged to secure said slidable component against withdrawal from said frame by swivel operation from a non-blocking rest position into a blocking position relative to a slidable component roller,

said swivel catch means, in said blocking position, projecting into a path of withdrawal of a slidable component roller to block said roller from withdrawal from said insertion aperture,

wherein at least one said swivel catch means is mounted on at least one of said axles of said frame guide rollers.

4,962,975

HYDRAULIC BRAKE CIRCUIT FOR A MOTOR VEHICLE EQUIPPED WITH A WHEEL ANTI-LOCK DEVICE

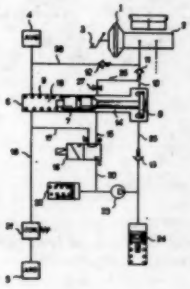
Gilbert Kervagoret, Argenteuil, France, assignor to Bendix France, Drancy, France

Continuation of Ser. No. 339,909, Apr. 17, 1989, abandoned, which is a continuation of Ser. No. 159,620, Feb. 23, 1988, abandoned. This application Apr. 2, 1990, Ser. No. 504,077

Claims priority, application France, Feb. 26, 1987, 87 02539

Int. Cl.[5] B60T *8/32*

U.S. Cl. 303—116 **7 Claims**



1. A hydraulic brake circuit for a motor vehicle equipped with a wheel anti-lock device, the circuit comprising a master cylinder controlled by a pedal, at least one wheel brake associated with a wheel of the vehicle, a filtering element for isolating the master cylinder from pressure pulses generated in the circuit during the operation of the anti-lock device, a solenoid valve having first, second, and third inlets, said first and second inlets being connected for normal operation of the brake circuit, and, under control of the anti-lock device, said second and third inlets being connected for reducing fluid pressure in said wheel brake connected to said second inlet by putting the second inlet in communication, through said third inlet, with a first accumulator and an inlet of a pump communicating with a second accumulator and said filtering element, the pump being activated by means of the anti-lock device at the same time as the solenoid valve so that fluid pressure in said second accumulator causes said filtering element to be closed and consequently the master cylinder to be isolated, characterized in that the circuit comprises a single spring-operated, pilot-controlled valve sensitive to a reduction in fluid pressure in said wheel brake, said pilot-controlled valve comprising a plunger having a head and one end opposite said head, a first chamber containing the single spring which biases said plunger toward an open position, said first chamber communicating with said wheel brake and with said second inlet of said solenoid valve, and a second chamber containing said head of said plunger, the plunger having movable seal means about the one end to isolate the chambers from one another, the head positioned for closing on a seat to divide the second chamber into first and second fluid compartments, said first fluid compartment having an effective cross-section which is greater than the effective cross-section of said master cylinder, said second fluid compartment being connected to said first inlet of said

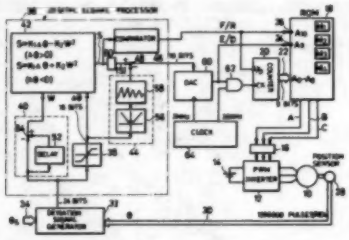
solenoid valve, the head of the plunger including an abutment portion which abuts a wall of the first fluid compartment when the plunger is in said open position, and a two-way flow restriction being provided for the pilot-controlled valve and communicating with said second accumulator and said second fluid compartment of said second chamber.

4,962,976

A.C. MOTOR DRIVE METHOD AND APPARATUS FOR PRECISION POSITIONAL CONTROL

Isao Takahashi, Nagaoka, and Makoto Iwata, Kawaguchi, both of Japan, assignors to Sanken Electric Co., Ltd., Saitama and Isao Takahashi, Niigata, both of, Japan

Filed Dec. 4, 1989, Ser. No. 445,480
Claims priority, application Japan, Mar. 11, 1989, 64-158493
Int. Cl.[5] H02P *5/28*
U.S. Cl. 318—81 **13 Claims**



1. A method of controllably driving a reversible alternating-current motor in revolving the same from one angular position to another, which method comprises:

(a) providing an inverter having a set of switches to be activated in prescribed on-off patterns to provide forward and reverse voltage vectors and a zero vector for controllably energizing the motor;

(b) providing memory means having written thereon forward voltage vector data representative of the on-off patterns of the inverter switches for forwardly energizing the motor, reverse voltage vector data representative of the on-off patterns of the inverter switches for reversely energizing the motor, and zero vector data representative of the on-off pattern of the inverter switches for arresting the rotation of the motor;

(c) generating a position error signal representative of the difference between the actual angular position of the motor and a desired angular position to which the motor is to be revolved;

(d) generating a motor speed signal representative of the actual running speed of the motor;

(e) predefining an idal control curve which is representative of the ideal relationship between the motor speed and the difference between the actual and the desired angular position and along which the motor speed is to be controlled in revolving the motor to the desired angular position;

(f) predefining a controlled acceleration range and an uncontrolled acceleration range on one side of the ideal control curve, and a controlled deceleration range and an uncontrolled deceleration range on the other side of the ideal control curve, both the controlled acceleration range and the controlled deceleration range decreasing in width toward the origin of the rectangular coordinate system on which the ideal control curve is plotted;

(g) reading out the voltage vector data and zero vector data from the memory means for causing the inverter to controllably energize the motor in order that an actual control curve representative of the actual relationship between the motor speed and the difference between the actual and the desired angular position may approximate the ideal control curve as closely as possible;

(h) only the forward voltage vector data being read out from the memory means when the actual relation between the motor speed and the difference between the actual and the desired angular position is in the uncontrolled acceleration range, in order to cause the inverter to generate the forward voltage vectors for rapidly accelerating the motor;

(i) both the forward voltage vector data and the zero vector data being read out from the memory means when the actual relation between the motor speed and the difference between the actual and the desired position is in the controlled acceleration range, in order to cause the inverter to generate the forward voltage vectors and the zero vector for controllably accelerating the motor;

(j) both the reverse voltage vector data and the zero vector data being read out from the memory means when the actual relation between the motor speed and the difference between the actual and the desired angular position is in the controlled deceleration range, in order to cause the inverter to generate the reverse voltage vectors and the zero vector for controllably decelerating the motor; and

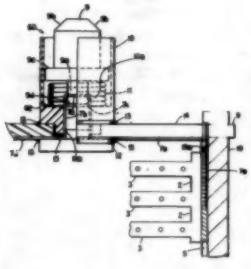
(k) only the reverse voltage vector data being read out from the memory means when the actual relation between the motor speed and the difference between the motor actual and the desired angular position is in the uncontrolled deceleration range, in order to cause the inverter to generate the reverse voltage vectors for rapidly decelerating the motor.

4,962,977

ELECTRIC FUSE

David E. Suuronen, Newburyport, Mass., assignor to Gould Inc., Eastlake, Ohio

Filed Jun. 28, 1989, Ser. No. 372,665
Int. Cl.[5] H01H *85/30*
U.S. Cl. 337—244 **28 Claims**



1. A blown-fuse indicator preassembly comprising

a stationary structure including an indicator housing having a chamber therein,

an indicator pin mounted in said chamber for movement from a nonindicating position to an indicating position,

an indicator spring mounted between said indicator housing and said indicator pin so as to bias said indicator pin from said nonindicating position to said indicating position, and

a flexible indicator restraining wire having a first portion engaging said pin for restraint and, on respective sides of the first portion, second and third portions extending out of the indicator housing, said wire being in tension against force provided by said indicator spring to said indicator pin, said indicator wire restraining said pin in said nonindicating position and maintaining said spring cocked, said second and third portions being secured under tension by rigid bonding to said stationary structure.

4,962,978

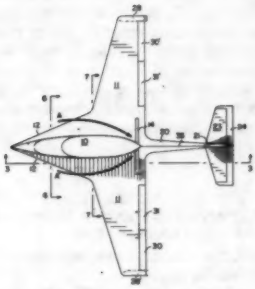
HIGH EFFICIENCY SEAPLANE

Paul H. Weston, 4214 W. Lk. Sammamish Pkwy. NE. #306, Redmond, Wash. 98052

Continuation-in-part of Ser. No. 168,427, Mar. 15, 1988, abandoned. This application Apr. 26, 1989, Ser. No. 343,503

Int. Cl.[5] B64C 1/00

U.S. Cl. 244—105 6 Claims



1. A seaplane having a longitudinal center line, a low wing, a pusher propeller, a tail boom and an empennage supported by said tail boom;

said wing having a span, a chord, a forwardly extending central portion, opposite side portions flanking said central portion, and a leading edge extending along said side portions and said central portion, said forwardly extending central portion in plan view being essentially in the shape of an isosceles triangle;

said central portion having a width in the range of ¼ to ½ of said span; and

said central portion extending forwardly from the side portions.

4,962,979

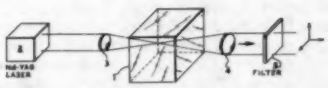
OPTICAL NONLINEARITY IN ORGANIC AND ORGANOMETALLIC MOLECULES VIA LATTICE INCLUSION COMPLEXATION

Albert G. Anderson; David F. Eaton; Wilson Tam, and Ying Wang, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 905,907, Sep. 10, 1986, Pat. No. 4,818,898. This application Feb. 3, 1989, Ser. No. 306,126

Int. Cl.[5] G02B 5/20

U.S. Cl. 350—1.1 49 Claims



1. In a nonlinear optical device comprising means for generating at least one incident beam of electromagnetic radiation, an optical element having nonlinear optical properties whereby electromagnetic radiation emerging from said element contains at least one frequency different from the frequency of any incident beam of radiation, said different frequency being an even multiple of the frequency of one incident beam of electromagnetic radiation, and means for directing the incident beam of electromagnetic radiation into the optical element, the improvement characterized in that said optical element comprises a crystalline inclusion complex formed from crystallization of a lattice-forming host compound in the presence of a nonlinearly polarizable guest compound in a noncentrosymmetric space group, said guest compound

(i) being nonlinearly polarizable in the presence of an electromagnetic field, and

(ii) having a molecular width, W, such that $D/2<W<D$, where D is the diameter of the channel cavity; wherein

(A) the lattice-forming host compound is selected from the group consisting of

(a) Hofmann clathrate lattice compounds having the formula $M^1(NH_3)_2Ni(CN)_4$ wherein M^1 is Mn, Ni, Cu or Cd;

(b) Werner coordination complexes having the formula $M^2X_2A_4$ wherein M^2 is divalent and is Fe, Co, Ni, Cu, Zn, Cd, Mn, Hg or Cr; X is NCS^-, NCO^-, CN^-, NO_3^-, NO_2^-, Cl^-, Br^-, or I^-; and A is substituted pyridine, α-arylalkylamine or isoquinoline;

(c) cyclophosphazenes;

(d) tris-ortho-thymotide;

(e) urea, thiourea and selenourea;

(f) phenols, hydroquinones and Dianin's compound;

(g) perhydrotriphenylene;

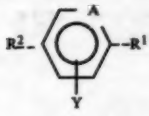
(h) cyclotriveratrylene;

(i) trianthranilides; and

(j) deoxycholic acid; and

(B) the guest compound is selected from the group consisting of

(a) substituted aromatic compounds of the formula



wherein

A is CH or N;

R^1 is $—NH_2$, $—NHCH_3$, $—N(CH_3)_2$, or $—C(O)M(CO)_x$ where M is Mn or Re and x is 5 or M is Co and x is 4;

R^2 is $—NO_2$, —CN, $(CH{=}CH)_nC(O)H$ where n is 1 to 3, or 4-(dicyanomethylene)-2-methyl-6-vinyl-4H-pyran; and

Y is —H, $—CH_3$, $—OCH_3$, —OH, —F or Cl; and

(b) octahedrally coordinated transition metal complexes having a π-bonded ligand and having the formula

$$[L^1M^3L^2_m]p$$

wherein

M^3 is Cr, Mo, W, Mn, Tc, Re, Fe, Ru, Os, Rh or Ir;

L^1 is an olefinic or aromatic ligand capable of π-bonding to M^3 to form part of an octahedral complex;

each L^2 is independently an unidentate ligand;

m is 1–3; and

p is −1, 0 or +1; with the proviso that said inclusion complex is other than a complex of thiourea and benzene molybdenum tricarbonyl or a complex of tris-ortho-thymotide and stilbene chromium tricarbonyl.

4,962,980

LASER SCANNER ENGINE WITH FOLDED BEAM PATH

Carl H. Knowles, Moorestown, N.J., assignor to Metrologic Instruments, Inc., Bellmawr, N.J.

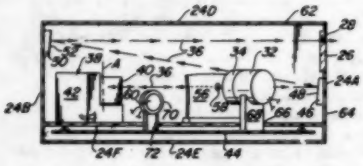
Filed Jan. 23, 1989, Ser. No. 299,998

Int. Cl.[5] G02B 26/10; G06K 7/10

U.S. Cl. 350—6.6 52 Claims

1. A module for use in a scanning system, said module comprising a housing comprising a front end and a rear end, said front end having a window therein, first means for sweeping a laser beam from a predetermined point within said housing through a predetermined angle to produce a swept beam scan pattern comprising at least one line, and second means for projecting said pattern out of said window, the length of said line at said window being predetermined, said swept beam

forming a path through said housing, said second means being located between said first means and said window and comprising beam folding means, said beam folding means comprising first and second reflecting means, one of said reflecting means being located within said housing adjacent said window and the other of said reflecting means being located within said housing adjacent said rear end and disposed generally opposite to said first reflecting means, said first means directing said swept beam to said first reflecting means, said first reflecting



means directing said swept beam to said second reflecting means, said second reflecting means directing said swept beam to said window, whereupon said beam folding means folds the path of said swept beam within said housing so that said predetermined point may be located closer to said window that if said swept beam was projected linearly through said predetermined angle from a point to said window to produce a scan line of said predetermined length at said window, thereby enabling said housing to be very compact.

4,962,981

OPTICAL SCANNER

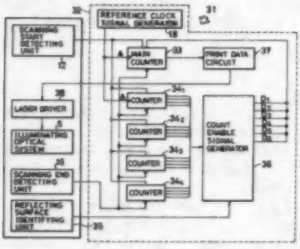
Kazunori Murakami; Yasuo Matsumoto; Tomonori Ikumi, all of Shizuoka, and Shoichi Sato, Tokyo, all of Japan, assignors to Tokyo Electric Company, Ltd., Tokyo, Japan

Filed Jul. 11, 1989, Ser. No. 377,951

Claims priority, application Japan, Aug. 30, 1988, 63-216074; Aug. 31, 1988, 63-216993

Int. Cl.[5] G02B *26/10*

U.S. Cl. 350—6.7 **7 Claims**



1. In an optical scanner comprising: a print data circuit which provides dot image information in synchronism with a print control clock signal having a frequency which is a submultiple of the frequency of a reference clock signal; an illuminating optical system connected to the print data circuit to emit laser beams representing the dot image information; a polygonal rotating mirror having a plurality of reflecting surfaces, disposed with its center of rotation on the optical axis of the illuminating optical system, and driven by driving means for rotation at a constant rotating speed; and a focusing optical system for focusing a laser beam reflected by the polygonal rotating mirror in a spot on a photoconductive body; the improvement comprising: scanning time measuring means for measuring a scanning time of a laser beam reflected by each reflecting surface of the polygonal rotating mirror by using a scanning start detecting unit disposed at a scanning start position of a scanning range to be swept by a laser beam and a scanning end detecting unit disposed at a scanning end position of the scanning range; correction clock pulse calculating means for calculating the number of reference clock pulses necessary for scanning a scanning line of a fixed length on the basis of each measured scanning time, and calculating the difference between the number of pulses of the reference clock signal corresponding to the scanning time of the laser beam reflected by each reflecting surface of the polygonal rotating mirror, and the number of pulses of the reference clock signal corresponding to the scanning time of the laser beam reflected by a specific reflecting surface among those of the polygonal rotating mirror; and scanning length matching means for distributing the pulses of a correction clock signal calculated by the correction clock pulse calculating means in a print control clock signal for each reflecting surface of the polygonal rotating mirror.

4,962,982

LIGHT BEAM SCANNING DEVICE AND LIGHT BEAM SCANNING LENS

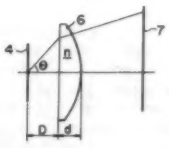
Kenichi Takanashi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 318,259

Claims priority, application Japan, Mar. 4, 1988, 63-51159

Int. Cl.[5] G02B *26/08*

U.S. Cl. 350—6.8 **3 Claims**



1. A light beam scanning device comprising:

a light source for emitting rays of light;

a converging optical system for converging the rays of light from said light source into a convergent light beam;

a first focusing optical system for converging said convergent light beam in one direction into a linear image having a longitudinal direction corresponding to a main scanning direction in the light beam scanning device;

a light deflector for deflecting the light beam, said light deflector having a deflecting surface disposed near a point where said linear image is focused by said first focusing optical system, wherein said convergent light beam deflected by said light deflector is deflected at a constant angular velocity;

a second focusing optical system for focusing the light beam deflected by said light deflector onto a scanned surface in the main scanning direction to scan said scanned surface with the focused light beam at a substantially constant speed, said second focusing optical system placing a point where the light beam is deflected by said light deflector and said scanned surface in substantially conjugate relationship to each other with respect to the second focusing optical system in an auxiliary scanning direction transverse to said main scanning direction in terms of geometrical optics; and

said second focusing optical system comprising a single-element lens having a cylindrical surface facing said light deflector and having a negative refracting power in said auxiliary scanning direction, and a toric surface facing said scanned surface and having different positive refracting powers respectively in said main and auxiliary scanning directions, said second focusing optical system having a refractive index n, a central thickness d, a maximum effective deflection angle θ in said main scanning direction, and

a focal length f in the main scanning direction, said cylindrical surface of the second focusing optical system being spaced by a distance D from the point where the light beam is deflected by said light deflector, said second focusing optical system having a front principal point which is spaced by a distance S from a point where the light beam is focused by said converging optical system in the main scanning direction, said second focusing optical system meeting the following conditions:

$$0.82 < [\{(n-1)f - d\}/D] \cdot [\cos\theta / \sqrt{n^2 - \sin^2\theta}] < 1.28; \quad \text{(I)}$$

and

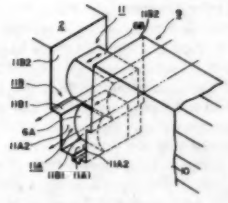
$$1.9 < (nf)/S < 3.2. \quad \text{(II)}$$

4,962,983

LASER OPTICAL APPARATUS

Yoshiaki Watanabe, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 286,851
Claims priority, application Japan, Dec. 21, 1987, 62-323290
Int. Cl.[5] G02B *26/10*
U.S. Cl. 350—6.8 **21 Claims**



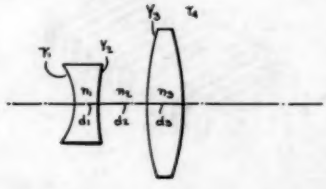
1. A laser optical apparatus, comprising:
means for emitting first and second laser beans;
a first lens for passage of the first laser beam;
a second lens for passage of the second laser beam, said second lens including top and bottom surfaces; and
means for positioning the bottom surface of the second lens;
wherein the top surface of said second lens positions said first lens.

4,962,984

CONSTANT-SPEED SCANNING LENS SYSTEM

Chien-Ping Kung, Hsin-Chu, Taiwan, assignor to Industrial Technology Research Institute, Taiwan, Taiwan

Filed Sep. 8, 1988, Ser. No. 241,631
Int. Cl.[5] G02B *26/10*
U.S. Cl. 350—6.8 **7 Claims**



1. A constant-speed scanning lens system comprising a first and a second lens each having a common principal axis and being in spaced relationship to one another,

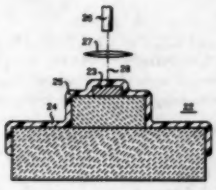
(a) said first lens being a biconcave negative lens having the function of diverging parallel rays; and
(b) said second lens being a biconvex positive lens having the function of focusing said diverging rays;
and which satisfy the following conditions:
(1) $0.0734\ f < d_2 < 0.097\ f$
(2) $-3.9230\ f < r_1 - 1.623\ f$
(3) $-35.3 < r_3/r_4 < -7.5$
wherein
d_2 is the airspace between the first lens and the second lens;
r_1 is the radius of curvature of the light entrance side of the first lens;
r_3 is the radius of curvature of the light entrance side of the second lens;
r_4 is the radius of curvature of the light exit side of the second lens; and
f is the focal length of the scanning lens system.

4,962,985

PROTECTIVE COATINGS FOR OPTICAL DEVICES COMPRISING LANGMUIR-BLODGETT FILMS

Jane D. LeGrange, Princeton, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 2, 1989, Ser. No. 415,824
Int. Cl.[5] G02B *6/26*; B05D *5/06*; C08G *69/26*; B32B *27/00*
U.S. Cl. 350—96.15 **6 Claims**



1. An optical communication system comprising:
a first optical device adapted to be optically coupled to a second optical device by light of a predetermined optical frequency transmitted along an optical path extending between the first and second optical devices;
said first optical device being of a type that is susceptible to deterioration if exposed over a period of time to atmospheric contaminants;
means comprising a Langmuir-Blodgett film convering at least part of the first optical device for sealing said first optical device, thereby preventing water vapor molecules and other atmospheric contaminants from contacting the first optical device;
said Langmuir-Blodgett film extending across said optical path;
said Langmuir-Blodgett film having a thickness of less than one-thirtieth the wavelength of said light at said optical frequency.

4,962,986

DEVICE FOR COUPLING LIGHT TO AND FROM A LIGHT GUIDE

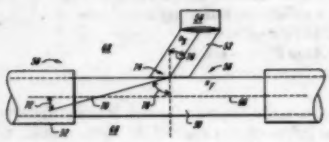
M. ten Hompel, Dortmund; Christoph Gebauer, Hamm, and Roland Scherer, Weinheim, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed Apr. 13, 1989, Ser. No. 337,275
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1988, 3812203
Int. Cl.[5] G02B *6/26, 6/20*; H01J *5/16*; G02F *1/00*
U.S. Cl. 350—96.15 **13 Claims**

1. A device for coupling light into and out of a light guide

transmitting light in a propagation direction and surrounded by a light transmitting medium, comprising:

a coupling element contacting the core of the light guide and



movable along the light propagation direction, wherein the coupling element has an index of refraction greater than the index of refraction of the light transmitting medium surrounding the light guide.

4,962,987

OPTICAL DEVICE PRODUCING AN INTENSITY DEPENDENT PHASE SHIFT

Nicholas J. Doran, Cambridge, England, assignor to British Telecommunications public limited company, London, England

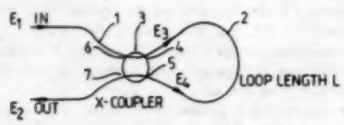
PCT No. PCT/GB87/00739, § 371 Date Jun. 20, 1988, § 102(e) Date Jun. 20, 1988, PCT Pub. No. WO88/02875, PCT Pub. Date Apr. 21, 1988

PCT Filed Oct. 20, 1987, Ser. No. 209,479

Claims priority, application United Kingdom, Oct. 20, 1986, 8625088; Oct. 22, 1986, 8625281; Jul. 22, 1987, 8717376

Int. Cl.[5] G02B *6/26*

U.S. Cl. 350—96.15 **14 Claims**



12. An optical device comprising:

a coupling means having first and second pairs of optical communication ports, in which portions of an optical signal received at a port of one pair are coupled into each port of the other pair in a predetermined coupling ratio; and

an optical waveguide comprising material which supports soliton effects when optical pulses at appropriate working intensities are injected into the device, the length of the waveguide being sufficient such that the intensity dependent phase of an injected pulse is substantially uniform throughout the pulse after propagation through the waveguide, at least a portion of such waveguide including a first material having a non-linear refractive index, the optical waveguide coupling together the first pair of ports; the coupling ratio and appropriate waveguide parameters being selected such that in use the portions of an optical signal at a working intensity received at one of the second pair of ports of the coupling means and coupled into each end of the waveguide return with an intensity depending relative phase shift after travelling around the waveguide.

4,962,988

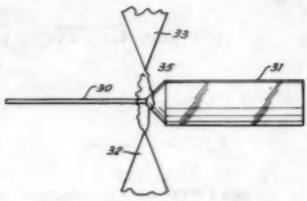
TERMINATION INTERFACE STRUCTURE AND METHOD FOR JOINING AN OPTICAL FIBER TO A GRADED INDEX ROD LENS

Thomas A. Swann, Espanola, N. Mex., assignor to Optomec Design Company, Santa Fe, N. Mex.

Filed Jul. 10, 1989, Ser. No. 377,469

Int. Cl.[5] G02B *6/32*

U.S. Cl. 350—96.18 **9 Claims**



1. A termination interface structure for an optical fiber for interfacing said fiber with a collimated light beam comprising:

a cylindrical graded index (GRIN) glass rod lens of substantially circular cross-section and of a length suitable for collimation of light transmitted from said optical fiber and for focusing of collimated light transmitted to said optical fiber, said lens having a diameter measuring at least 500% of the diameter of said optical fiber, having a first end surface which is substantially plane, or of low axially symmetrical curvature, intersecting the circumferential surfaces of said rod lens and a second end surface which is tapered in axial symmetry by at least a third of the cross-section radius of said rod lens and over a length at least equal to the portion of the cross-section radius over which the taper extends, said taper leaving a central transverse end surface of said second end surface for connection to said optical fiber, and

a fused butt joint joining an end of said optical fiber to said rod lens at said transverse end surface.

4,962,989

CLAMPING APPARATUS FOR AN ARRAY OF OPTICAL FIBER FILAMENTS

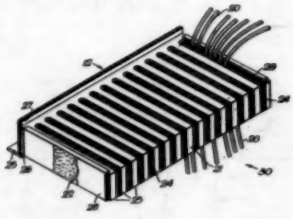
Roger E. Jung, Chingford, and Brian P. Mills, Hornchurch, both of Great Britain, assignors to Telephone Cables Limited, England

Filed Aug. 31, 1989, Ser. No. 401,754

Claims priority, application United Kingdom, Nov. 9, 1988, 8826202

Int. Cl.[5] G02B *6/26, 6/40*; B65D *85/38, 1/34*

U.S. Cl. 350—96.20 **8 Claims**



1. Apparatus for clamping an array of generally parallel adjacent filaments, comprising: at least three coplanar resiliently compressible foam fingers whose adjacent side faces, normal to the plane of the fingers, define between them slots

whose major portions at least are of uniform width, for receiving intermediate portions of the respective filaments extending normal to the plane of the fingers, the side faces being resiliently compressible by an inserted filament whereby to grip frictionally that filament with a force which does not vary with the position of the filament along the major portion of the slot.

4,962,990

OPTICAL DEVICE

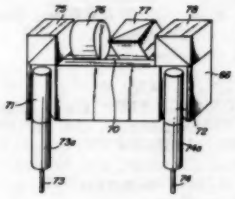
Soichiro Matsuzawa, Kuwana; Yoshinari Kozuka, Nagoya; Shuhei Toyoda, Nagoya; Shogo Kawaguchi, Nagoya, and Masami Matsuura, Ama, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Mar. 24, 1989, Ser. No. 328,282

Claims priority, application Japan, Mar. 25, 1988, 63-71114

Int. Cl.[5] G02B *6/26, 6/36*

U.S. Cl. 350—96.20 **19 Claims**



1. An optical device for detecting an electric or magnetic field comprising:

an optical bench comprising first, second and third supporting sections, said first and third supporting sections each having at least two supporting surfaces extending in different planes, said first and third supporting sections being separated from each other by said second supporting section;

first optical means for projecting light in a direction parallel to an intersectional line of said planes of said first supporting section;

second optical means for sensing the electric or magnetic field, said second optical means comprising an optical element whose optical characteristic is influenced by said electric or magnetic field and which serves to rotate a plane of polarization of the light projected from said first optical means; and

third optical means comprising a light reflection member for reflecting light emanated from said second optical means back to the first optical member;

wherein the optical axes of said first, second and third optical means are coaxial, and the light projected from the first optical means is transmitted into said second optical means and then reflected by the light reflection member of the third optical means back to the first optical means via the second optical means to detect the electric or magnetic field.

4,962,991

QUICK-DISCONNECT WAVEGUIDE CONNECTOR ASSEMBLY

Ronald M. Carvalho, Boxborough, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 23, 1985, Ser. No. 693,928

Int. Cl.[5] G02B *6/38*

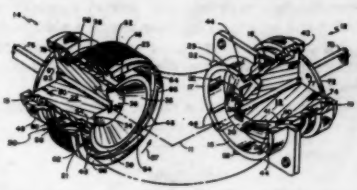
U.S. Cl. 350—96.21 **7 Claims**

1. A connector assembly comprising:

a pair of connectors, a first one of the pair of connectors comprising a first mating inner member having a protruding region, and a second one of the pair of connectors comprising a second mating inner member comprising cavity means for receiving the protruding region, said first mating inner member having a radio frequency energy waveguide opening disposed through the protruding region thereof, and said second mating inner member having a radio frequency energy waveguide opening disposed therethrough and terminating at the cavity means thereof;

said first connector comprising a first outer member rotatably mounted on the first mating inner member;

said second connector comprising a second outer member disposed on the second mating inner member; and



wherein the first and second outer members include means for locking the first outer member to the second outer member, when the protruding region of the first mating inner member is received by the cavity means of the second mating inner member, upon rotation of the first outer member through a portion of a full turn about the second outer member.

4,962,992

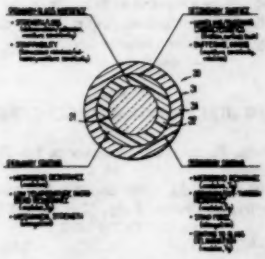
OPTICAL TRANSMISSION MEDIA AND METHODS OF MAKING SAME

J. Thomas Chapin, Alpharetta; Addison G. Hardee, Jr., Dunwoody; Lisa M. Larsen-Moss, Stone Mountain; Charles M. Leslie, Lawrenceville; Bob J. Overton, Lawrenceville; John W. Shea, Chamblee; Carl R. Taylor, Lawrenceville, and John M. Turnipseed, Lilburn, all of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 15, 1989, Ser. No. 351,984

Int. Cl.[5] G02B *6/44*

U.S. Cl. 350—96.23 **29 Claims**



1. An optical fiber cable, which comprises:

at least one optical fiber comprising a core and a cladding;

a coating system which comprises:

a first coating material which engages and which encloses substantially the optical fiber, said first coating material being one which is characterized by a modulus spectrum and a glass transition temperature which are such as to provide suitable resistance to microbending over a predetermined temperature range, and being characterized by an adhesion to the optical fiber which is substantially uniform and continuous and free from delamina-

tion and heterogeneous materials at the interface between the optical fiber and the first coating material, which is optimal to avoid tenacious residues on the optical fiber after the first coating material is removed from the optical fiber and which is substantially constant with respect to time, said modulus spectrum, glass transition temperature and adhesion being substantially maintained under relatively high humidity and relatively long aging conditions; and

a second coating material which encloses substantially the first coating material, said second coating material being one which is characterized by a sufficiently low glass transition temperature to avoid delamination of the coating system from the optical fiber and to provide suitable resistance to microbending; and

a jacket which is made of a plastic material and which encloses said at least one optical fiber.

4,962,993

FIBRE-TYPE LIGHT CONVERSION DEVICE

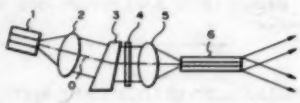
Sota Okamoto, and Kiyofumi Chikuma, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 30, 1989, Ser. No. 357,819

Claims priority, application Japan, Nov. 2, 1988, 63-278201

Int. Cl.[5] G02F 1/35

U.S. Cl. 350—96.29 **6 Claims**



1. A fiber light conversion system, comprising:

a fiber light conversion element having a non-linear optical crystal core therein for converting the wavelength of an incident light beam;

a light house; and

means for introducing the light beam from the light source to the wavelength conversion element as the incident light beam, the means including a rotatable phase shifter for rotating the plane of polarization of the incident light beam, the degree of rotation being selected to maximize the non-linear polarization generated by the non-linear sensitivity of the fiber element crystal core.

4,962,994

CIRCULAR BIREFRINGENT DIELECTRIC WAVE GUIDE

Carlo G. Someda, Padua, Italy, assignor to Pirelli General plc, London, England

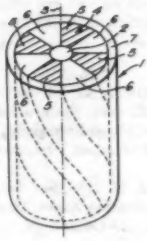
Filed May 31, 1989, Ser. No. 359,103

Claims priority, application Italy, May 31, 1988, 20804 A/88

Int. Cl.[5] G02B 6/22

U.S. Cl. 350—96.33 **5 Claims**

1. A dielectric wave guide which in cross-section normal to its longitudinal axis has a central circular area having a refractive index n_1; an annular intermediate region around said central circular area divided into an integral number times eight angular sectors, said sectors being spaced from said longitudinal axis by predetermined distances and respective alternate sectors being of a first type having a refractive index n_3 and a second type having a refractive index n_4, n_3 being substantially constant, n_4 varying substantially in inverse proportion to the square of the distance of the sector of said second type from said longitudinal axis and n_3 being not greater than n_4 at any point in said wave guide; and an annular outer area having a refractive index n_2 disposed around said annular intermediate region; said wave guide being twisted with respect to the longitudinal axis thereof and being characterized by the angular sectors of the second type having an elasto-optic coefficient



under torsional stresses which is different from that of the angular sectors of the first type.

4,962,995

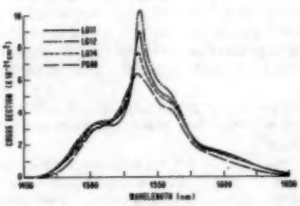
GLASSES FOR HIGH EFFICIENCY ERBIUM (3+) OPTICAL FIBER LASERS, AMPLIFIERS, AND SUPERLUMINESCENT SOURCES

Leonard J. Andrews, Wayland, and William J. Miniscalco, Sudbury, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jun. 16, 1989, Ser. No. 367,393

Int. Cl.[5] G02B 1/00; C03C 13/04

U.S. Cl. 350—96.34 **45 Claims**



1. A glass composition for an optical fiber amplifier system, said optical fiber having an active medium comprising a fluoride glass containing one of ErF_3 and Er_2O_3, said optical fiber amplifier system amplifying at a wavelength as a result of a transition from the electronic state $^4I_{13/2}$ of Er^{3+} to the $^4I_{15/2}$ electronic state of Er^{3+}

4,962,996

PROTECTED FIBER OPTIC WAVEGUIDE

Enrique Cuellar, Palo Alto; Stephen F. Powell, Woodside; Daniel R. Roberts, San Mateo, and Pravin L. Soni, Union City, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 96,108, Sep. 11, 1987, abandoned. This application Jun. 28, 1989, Ser. No. 372,109

Int. Cl.[5] G02B 6/02, 1/04

U.S. Cl. 350—96.34 **12 Claims**

1. A protected fiber optic waveguide comprising:

(I) a core;

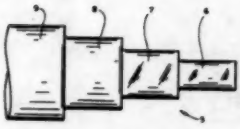
(II) a cladding disposed on, around, and in contact with the exterior surface of the core; and

(III) a buffer coating disposed on, around, and in contact with the exterior surface of the cladding, the buffer coating comprising a polysiloxane material comprising:

(a) a polydimethylsiloxane and

(b) a copolysiloxane comprising

(i) a repeat unit selected from the group consisting of methylphenylsiloxane and diphenylsiloxane and
(ii) a dimethylsiloxane repeat unit,
the molar ratio of units (i) to units (ii) being between about 10:90 and about 80:20 if unit (i) is methylphenylsiloxane and between about 5:95 and about 50:50 if unit (i) is diphenylsiloxane;
the weight ratio of polydimethylsiloxane (a) to copolysiloxane (b) being between about 20:80 and about 85:15.

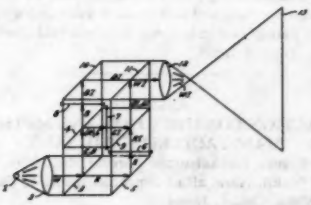


4,962,997

THREE COLOR SEPARATION USING SUBTRACTIVE DICHROIC BEAMSPLITTERS

Richard R. Baldwin, Saratoga, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 21, 1988, Ser. No. 184,459
Int. Cl.[5] G02B *27/10*
U.S. Cl. 350—172 **14 Claims**



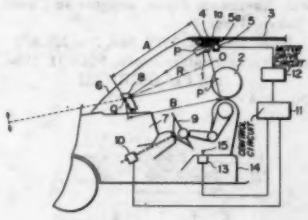
1. An optical transmission system comprising:
a light source for providing a first, a second, and a third color of light;
a first means for passing in a first direction said second and third colors of light while passing in a second direction said first color of light as a separated first color source, said first means comprising a filter which passes said first color and reflects said second and third colors in a single direction;
a second means for passing in a first direction said second color of light as a separated second color source while passing in a second direction said third color of light as a separated third color source;
a first image light valve means for receiving light from said separated first color source and modulating said light with image information to provide a first image beam of said first color;
a second image light valve means for receiving light from said separated second color source and modulating said light with image information to provide a second image beam of said second color;
a third image light valve means for receiving light from said separated third color source and modulating said light with image information to provide a third image beam of said third color; and
means for combining said first, second, and third image beams to provide a multi-colored image beam, wherein said means for combining comprises:
a first filter which passes a first one of said image beams and reflects a second one of said image beams; and
a second filter which passes said first and second ones of said image beams and reflects a third one of said image beams,
wherein none of said first, second or third color of light impinge upon more than three filters.

4,962,998

INDICATION DISPLAY UNIT FOR VEHICLES

Tadashi Iino, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Sep. 6, 1988, Ser. No. 240,664
Claims priority, application Japan, Sep. 7, 1987, 62-222011
Int. Cl.[5] G02B *27/14*
U.S. Cl. 350—174 **4 Claims**



1. An indication display unit for a vehicle for enabling a driver to sight an indication image comprising an image projector device having an indicating means, a light source and an optical system; a projecting surface means having a concave surface along its length for directly reflecting thereon the indication image from the image projector device to the driver and located in front of a driver's seat at a predetermined interval; and control means operably coupled to the image projector device for controlling a projected image of indications projected from the image projector device, said control means controls the projected image of indications dependent on the steering angle of the vehicle.

4,962,999

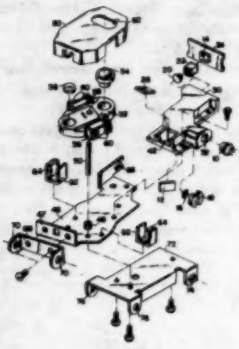
OPTICAL PICK-UP DEVICE

Ikuo Kasuga, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Sep. 16, 1988, Ser. No. 245,416
Claims priority, application Japan, Sep. 16, 1987, 65-141437; Sep. 16, 1987, 65-141438; Sep. 16, 1987, 65-141439
Int. Cl.[5] G02B *7/02*
U.S. Cl. 350—247 **19 Claims**

1. An optical pick-up device comprising:
a base plate made of a cold rolled plate;
a fixed supporting frame made of a prefabricated piece supported by said base plate, secured thereto, to which opti-

cal elements including a semiconductor laser device, a beam splitter, a light receiving element, etc. are fixed; and



a movable supporting frame holding at least an objective lens and supported by said base plate so that the position can be controlled.

4,963,000

LENS BARREL

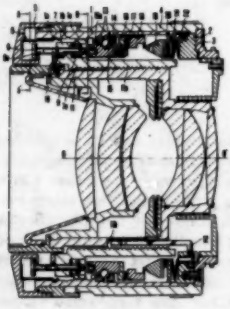
Tokru Kawai, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1989, Ser. No. 326,679

Claims priority, application Japan, Mar. 31, 1988, 63-079101

Int. Cl.[5] G02B *7/02*

U.S. Cl. 350—254 **15 Claims**



1. A lens barrel comprising:

(a) a vibratory-wave motor mounted within said lens barrel, said vibratory-wave motor having a stator and a rotor which are in frictional contact with each other, each of said stator and said rotor having a hollow structure, a beam of light passing through hollow portions of the hollow structures;

(b) a lens group;

(c) a lens holding member for holding said lens group and movable along an optical axis of said lens group;

(d) a drive mechanism for moving said lens holding member along the optical axis;

(e) a rotary member to be rotated by said rotor, said rotary member being rotated at the same speed as that of said ro'or; and

(f) a clutch for changing over a connection and a non-connection of said rotary member with said drive mechanism, said clutch having members arranged to move into or out of a plurality of holes disposed in said rotary member, wherein when said members have moved into said holes, a rotation of said rotor is transmitted to said drive mechanism, and wherein when said members have moved out of said holes, the rotation of said rotor is not transmitted to said drive mechanism.

4,963,001

LIQUID CRYSTAL DISPLAY DEVICE

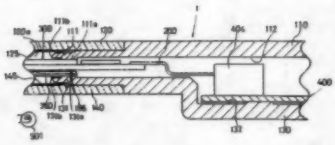
Akira Miyajima, Tokorzawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1989, Ser. No. 396,673

Claims priority, application Japan, Aug. 23, 1988, 63-110265[U]; Nov. 29, 1988, 63-155413[U]

Int. Cl.[5] G02F *1/13*; G03B *21/14*

U.S. Cl. 350—331 R **8 Claims**



1. A liquid crystal display device inserted between a light source and a lens of a projector for projecting an image onto a screen, comprising:

a housing comprising a front cover and a rear cover provided for forming a panel housing portion and a control circuit housing portion;

a liquid crystal display panel housing in said panel housing portion;

a control circuit housed in said control circuit housing portion;

a pair of transparent shielding plates provided on said front and rear covers for closing openings formed in said panel housing portion at opposite sides of said liquid crystal display panel,

each of said shielding plates being disposed to form a space between the plate and said liquid crystal display panel; and

at least a part of said rear cover adjacent said shielding plate being made of metal.

4,963,002

CONNECTION CONSTRUCTION AND METHOD OF MANUFACTURING THE SAME

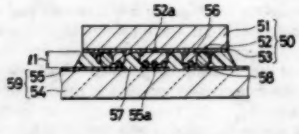
Yasunobu Tagusa, Kitakatsuragi; Hiroshi Matsubara, Tenri, and Takashi Nukii, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 6, 1989, Ser. No. 319,290

Claims priority, application Japan, Mar. 7, 1988, 63-54537

Int. Cl.[5] G02F *1/13*

U.S. Cl. 350—336 **10 Claims**



1. A connection construction for connecting a first conductor provided on a first member to a second conductor provided on a second member and disposed opposite to the first conductor, comprising:

a first electrically insulating adhesive deposited at least on the first conductor;

at least one conductive plastic bead bonded with the first adhesive to contact the first conductor and partly protrud-

ing toward the second conductor, each conductive bead having a plated nickel surface; and

a second electrically insulating adhesive for bonding the first member to the second member with the at least one conductive bead contacting the second conductor, spacing between the first and second conductors being less than a normal state, untensioned diameter of a largest one of the conductive beads whereby the at least one conductive bead is elastically depressed.

5. A method of manufacturing a connection construction for connecting a first conductor provided on a first member to a second conductor provided on a second member and disposed opposite to the first conductor, comprising the steps of:

depositing a first electrically insulating adhesive at least on the first conductor of the first member;

bonding at least one conductive particle to the first adhesive, the at least one conductive particle contacting the first conductor and a portion of the at least one conductive particle being exposed, an outermost exposed portion of each conductive particle lying generally in a plane;

hardening the first adhesive after the at least one conductive particle is bonded thereto;

interposing a second electrically insulating adhesive between the first member and the second member; and

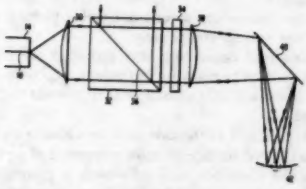
pressing the first member and the second member toward each other while the second adhesive retains its adhesive strength, and hardening the second adhesive with the conductive particle contacting the second conductor.

4,963,003

LASER OPTICAL SYSTEM

Hiroyuki Hiiro, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 21, 1989, Ser. No. 312,167
Claims priority, application Japan, Feb. 22, 1988, 63-38941
Int. Cl.[5] G02B *27/28*
U.S. Cl. 350—403 15 Claims



7. A laser optical system, comprising:

a broad contact semiconductor laser having a width of each stripe of at least a predetermined value and operative to radiate multiple parallel output beams at an emitting side;

a polarization beam splitter provided on said emitting side of the laser, said polarization beam splitter being adapted to transmit a P-polarized light beam and to reflect an S-polarized light beam in a direction different from that of transmission of the P-polarized light; and

a ¼ wavelength plate provided on the P-polarized light transmitting side of th epolarization beam splitter;

a plane-diffraction grating adapted to separate spectroscopically, by making use of diffraction, the P-polarized laser beam which passes through the ¼ wavelength plate;

lens means for focusing each of the laser beams which are generated by separating said laser beam by dispersion by the spectral element; and

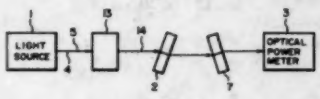
a phase correcting element provided at the diffraction focusing position of the lens and adapted to correct phases of each of the laser beams to obtain a Gaussian beam from the reflected beam.

4,963,004

OPTICAL ADDER FOR OPTICAL ATTENUATION

Masaichi Sato, and Hideo Imazeki, both of Tokyo, Japan, assignors to Ando Electric Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1989, Ser. No. 411,556
Claims priority, application Japan, Sep. 30, 1988, 63-247127
Int. Cl.[5] G02B *5/23, 5/30*
U.S. Cl. 350—403 1 Claim



1. An optical adder for accurately and additively specifying variable optical attenuation of a polarized light beam emitted from a light source, comprising:

a quarter wave plate disposed on an optical axis for changing an incident linearly polarized light beam emanating from the light source to a circularly polarized light beam; and

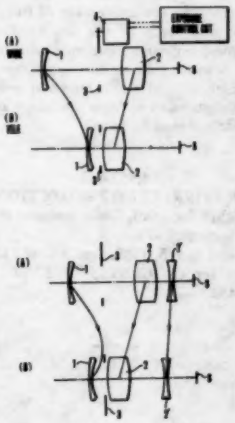
one or more neutral density filter plates all disposed on the optical axis next to said quarter wave plate for attenuating the incident circularly polarized light beam additively by a predetermined amount.

4,963,005

ZOOM LENS HAVING BUILT-IN DIAPHRAGM

Sadahiko Tsuji, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1987, Ser. No. 44,776
Claims priority, application Japan, May 14, 1986, 61-109982
Int. Cl.[5] G02B *15/177*
U.S. Cl. 350—426 10 Claims



1. A zoom lens with a fixed focal plane, comprising:

a first lens unit or group having a negative refractive power axially non-linearly movable for zooming; a second lens unit or group arranged next to said first lens unit or group, having a positive refractive power and disposed on the image side of said first lens unit or group to axially move simultaneously with and independently of said first lens unit or group; and a diaphragm arranged between said first and said second lens units or groups to remain stationary relative to said focal plane during zooming.

4,963,006

ZOOM LENS WITH INNER OR REAR FOCUSING SYSTEM

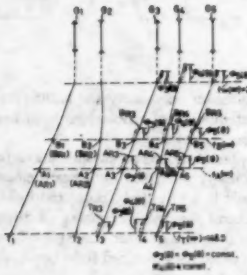
Kiyotaka Inadome, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 136,918, Dec. 22, 1987, abandoned. This application Jun. 3, 1988, Ser. No. 203,639

Claims priority, application Japan, Dec. 26, 1986, 61-312978; Jun. 4, 1987, 62-138998

Int. Cl.[5] G02B *15/14*

U.S. Cl. 350—427 **11 Claims**



1. A zoom lens including:

(a) a plurality of lens units movable along an optic axis; and

(b) means for prescribing the movements of said plurality of lens units along the optic axis for adjusting the focal length of said zoom lens with a desired range;

at least one of said plurality of lens units also being moved along the optic axis to form the image of an object lying at any distance from said zoom lens on a predetermined surface, said means having a member formed with a slot for each of the last-mentioned lens units, respectively, which prescribes the movement of that lens unit along the optic axis, each of the last-mentioned lens units being moved only in accordance with its said slot both when it is moved along the optic axis to change the focal length of said zoom lens and when it is moved along the optic axis to form the image of the object on said predetermined surface.

4,963,007

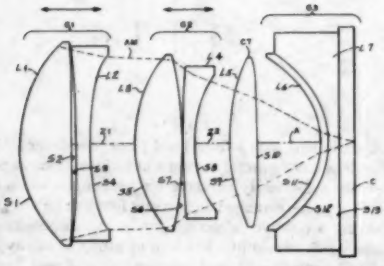
COLOR CORRECTED PROJECTION LENS

Jacob Moskovich, Cincinnati, Ohio, assignor to U.S. Precision Lens, Inc., Cincinnati, Ohio

Filed Sep. 5, 1989, Ser. No. 403,139

Int. Cl.[5] G02B *13/18, 27/18*

U.S. Cl. 350—432 **40 Claims**



1. A projection lens for a cathode ray tube comprising a rear lens unit adopted to be closely coupled to a cathode ray tube at the object end thereof, said lens unit having a strongly concave image side surface,

a front lens unit on the image side of said lens comprising a positive image side element having a dispersion similar to the dispersion of crown glass followed by a closely spaced negative element of high dispersion similar to the dispersion of flint glass, and

another lens unit providing substantially all of the positive optical power of said lens intermediate said front and rear lens units, said another lens unit including a negative element of high dispersion similar to the dispersion of flint glass on the object side thereof.

4,963,008

CORRECTION LENS SYSTEM USED IN PRODUCTION OF FLUORESCENT SCREEN OF COLOR PICTURE TUBE AND METHOD OF MANUFACTURING CORRECTION LENS SYSTEM

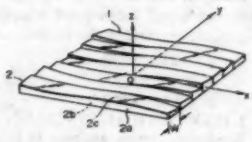
Takeo Fujimura, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 387,803

Claims priority, application Japan, Dec. 28, 1988, 63-332247

Int. Cl.[5] G02B *3/08*

U.S. Cl. 350—452 **11 Claims**



1. A correction lens system disposed between an exposure light source and a color picture tube panel subjected to exposure treatment for reducing the amount of mislanding by correcting the optical path of exposure rays in the process of producing the fluorescent screen of a color picture tube, said correction lens system comprising:

at least one first correction lens provided with a smooth curved surface portion for refracting exposure rays projected from said light source so as to correct said mislanding; and

at least one second correction lens provided with a discontinuous curved surface portion composed of a plurality of ribbon like elements each of which is provided with a smooth curved portion having a predetermined inclination at each point of said surface and the boundaries of which constitute discontinuous portions parallel to each other in one direction for refracting said exposure rays which have been refracted by said first correction lens so as to correct the mislanding component which remains uncorrected by said first correction lens.

4,963,009

OPTICAL ELEMENT FOR USE AS A TRANSPARENT VIEWING WINDOW

Hermann M. Gernet, 6, Dunantstrasse, 44 Münster, Fed. Rep. of Germany

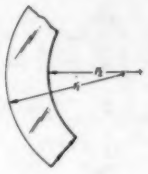
Continuation-in-part of Ser. No. 789,309, Dec. 17, 1985, abandoned. This application Mar. 25, 1988, Ser. No. 173,379

Int. Cl.[5] G02B *27/00*

U.S. Cl. 350—453 **2 Claims**

1. A telescope-like optical element with magnifying power for use as a transparent viewing window, curved around the user's eyes, made of a curved optical material with spherical inner and outer surfaces, said optical element having a refractive index n from 1.70 to 1.93, a thickness d from 0.06 m. to 0.32

m., an outer radius r1 of spherical curvature from 0.15 m. to 0.54 m., an inner radius r2 of spherical curvature from 0.09 m.



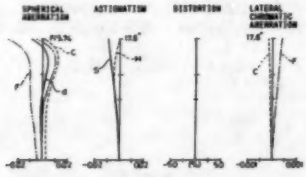
to 0.22 m., wherein the center of curvature of the outer surface is identical with the center of curvature of the inner surface.

4,963,010

COMPACT ZOOM LENS SYSTEM

Juro Kikuchi, Yamanashi, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1989, Ser. No. 392,572
Claims priority, application Japan, Aug. 16, 1988, 63-202699
Int. Cl.[5] G02B *15/15*
U.S. Cl. 350—481 **12 Claims**



1. A compact zoom lens system comprising, in the order from the object side, a first lens unit having positive refractive power and a second lens unit having negative refractive power, and so adapted as to vary focal length thereof by varying the airspace reserved between said first lens unit and said second lens unit, said first lens unit comprising an aperture stop, at least one lens component arranged on the object side of said aperture stop and at least one lens component arranged on the image side of said aperture stop, and at least one lens element arranged in said first lens unit being designed as a radial GRIN lens.

4,963,011

RAINDROP AND DUST FREE VISION FOR OUTSIDE REAR VIEW CAR MIRRORS

Chih-Hsiung Lu, 4th Fl., No. 5, Lane 306, Kung Kuan Road, Peitou, Taipei, Taiwan, and Jill H. Lu, 907 Manley Dr., San Gabriel, Calif. 91776

Filed May 18, 1989, Ser. No. 353,477
Int. Cl.[5] G02B *5/08*; B60R *1/06*
U.S. Cl. 350—584 **2 Claims**

1. A raindrop and dust free vision outside rear view mirror attached to an automobile adjacent to the side window of said automobile, said mirror comprising:

a mirror frame being composed of:

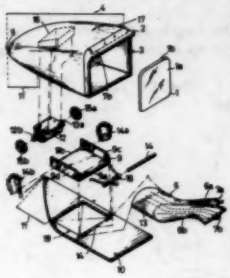
a protruding upper edge about 3 cm out over the top edge of said mirror to prevent raindrops from building up too much on the surface of said mirror, and

a streamlined body behind said mirror capable of enclosing a wind-guiding tunnel, and

an upward angled, tapered, and bifurcated wind-guiding tunnel inside said streamlined body, and

two long and narrow openings at the ends of said tunnel pointing toward the surface of said mirror and the adjacent side window respectively, and

a rectangular hole in the middle portion of the bottom or inferior border of said mirror frame wherein an U-shaped wind-guiding panel (either fixed or adjustable) contiguous



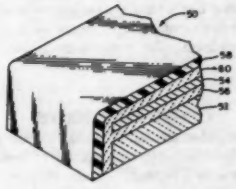
with said wind-guiding tunnel to concentrate and guide air currents through said wind-guiding tunnel to the surface of said mirror and the adjacent side window.

4,963,012

PASSIVATION COATING FOR FLEXIBLE SUBSTRATE MIRRORS

C. Edwin Tracy, and David K. Benson, both of Golden, Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 873,069, Jun. 4, 1986, Pat. No. 4,780,372, which is a continuation of Ser. No. 632,742, Jul. 20, 1984, abandoned. This application Oct. 19, 1988, Ser. No. 259,634
Int. Cl.[5] G02B *5/08, 7/18*
U.S. Cl. 350—641 **25 Claims**



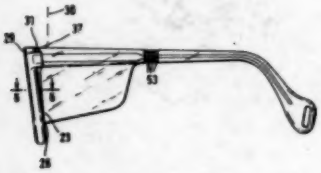
15. In a reflective metallic mirror, wherein a layer of reflective metal deposited on a substrate comprising an amorphous material forms a reflective surface, the improvement comprising:

a protective diffusion barrier comprised of a layer of silicon nitride positioned between the reflective metal layer and the amorphous substrate material for protecting the reflective metal layer and the interface of the metal layer with the amorphous material substrate from exposure to harmful precipitates of moisture, alkalis, and other impurities during exposure of the mirror to ambient environmental substances .

4,963,013
PROTECTIVE SPECTACLES

Walter H. Bonsai, Fellbach-Schmiden, Fed. Rep. of Germany, assignor to Marwitz & Hauser, Stuttgart, Fed. Rep. of Germany

Filed Jun. 4, 1984, Ser. No. 616,577
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1983, 3320351
Int. Cl.[5] G02C 5/16
U.S. Cl. 351—114 4 Claims



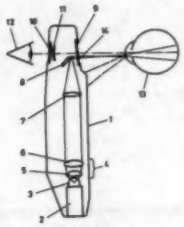
1. In a protective spectacles comprising a frame for lenses, having side profile sections, first hinge halves temporally fitted on the frame, earpieces having in their forward end region second hinge halves, which together with the first hinge halves form hinge zones for the earpieces,
the improvement wherein
(a) protective shields extend out rearward from the side profile section of the frame in the opened state of the earpieces,
(b) the protective shields are firmly connected at their upper edge regions to an associated earpiece,
(c) a predetermined bending zone is located on each earpiece following the protective shield,
(d) the bending zone is of a design adapted to alter the inclination of each earpiece upwards and downwards to a desired inclination relative to the frame and hold each earpiece in the desired inclination,
(e) the protective shields have forward edge profiles,
(f) the side profile sections of the frame have regions opposite the forward edge profiles of the protective shields in the opened state of the earpieces,
(g) the forward edge profiles of the protective shields and the opposite regions of the side profile sections of the frame are arranged and adapted to form sealed over-lapping profiles in the opened state of the earpieces,
(h) the protective shields are integral with the earpieces,
(i) the frame has an upper back that provides a gripping lateral jaw and anchors each first hinge half, and
(j) each earpiece has a small plate above and to the side of the hinge pivot axis that engages in a complementary recess on the frame above the lateral jaw.

4,963,014
OPHTHALMOSCOPE

Helmut A. Heine, Herrsching; Helmut Rosenbusch, Weilheim, and Otto H. Schmidt, Herrsching, all of Fed. Rep. of Germany, assignors to Propper Manufacturing Co., Ltd., Long Island City, N.Y.

Continuation of Ser. No. 171,985, Mar. 23, 1988, abandoned.
This application Mar. 6, 1990, Ser. No. 492,432
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1987, 8704606[U]
Int. Cl.[5] A61B 3/10
U.S. Cl. 351—205 7 Claims

1. Direct opthalmoscope apparatus for direct examination of a patient's eye comprising means for originating and projecting a beam of light along an illumination beam path into the eye of a patient and onto the fundus oculi of the eye, said means including a condenser system arranged in the illumination beam path to concentrate light from a light source and an objective system also arranged in the illumination beam path to direct the concentrated light into the patient's eye, said condenser system having at least one element with a nonspherical



optically effective surface which is cylindrical to shape the beam of light along the illumination beam path projecting into the eye of a patient.

4,963,015
RECORDING AND REPRODUCTION OF IMAGES

William Ling, London, England, assignor to Aspex Limited, England

Filed Mar. 6, 1989, Ser. No. 318,925
Claims priority, application United Kingdom, Jun. 22, 1987, 8714546
Int. Cl.[5] G03B 35/00
U.S. Cl. 352—57 13 Claims

1. A method of recording onto cinematographic film an image of a scene including at least one object moving relative to the film, the method comprising the steps of:
(a) forming onto each single frame of the film a plurality of partial images of the scene, including partial images of the object, taken at successive intervals of time;
(b) said partial images of the scene being overlaid on each said frame so that the partial images of the object are displaced in position relative to one another owing to the relative movement between the object and the film in the or each time interval between the formation of the successive partial images;
(c) each said partial image of the scene being divided into a number of areas;
(d) said successive partial images of the scene in each said area being recorded in light of different colours, said different colours being selected so that the overlaid partial images of the scene in each area combine to form a full colour image reproduction of the image;
(e) one of said areas in each partial image of the scene being recorded in light of a different colour from that of at least one other of said areas, so that the sequence of colours in which said plurality of successive partial images of the scene are recorded in said one area is different from the sequence of colours in which the said plurality of successive partial images are recorded in said other area;
(f) whereby, when the image is reproduced and viewed through filter spectacles allowing the left and right eyes of the viewer to see different ones of the partial images of the

scene or different combinations thereof, a stereoscopic effect is obtained.

4,963,016

COMPACT REAR-PROJECTION SYSTEM WITH OBLIQUELY INCIDENT LIGHT BEAM

Werner A. L. Heijnemans, and Gijsbertus Bouwhuis, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 18, 1986, Ser. No. 880,974

Claims priority, application Netherlands, Mar. 18, 1986, 8600684

Int. Cl.[5] G03B *21/10, 21/60*

U.S. Cl. 353—74 7 Claims

1. A rear-projection system comprising a rear-projection screen, at least one image source with an associated projection -lens system, and at least one mirror intended for folding the light path, the principal axis of the light beam from each image source intersecting the rear surface of the projection screen at an angle of the order of some tens of degrees to the normal to this surface, said rear-projection screen comprising a projection plate and a prism plate, said prism plate comprising a plurality of identical and identically oriented truncated horizontally extending prisms combined to form said prism plate, the rear of the prism plate constituting the rear of the projection screen, which prism plate causes the principal axis of the light beam issuing from the image source to be deflected in the same direction as the normal to the projection plate, each prism having a light-refracting front surface and a light-refracting rear surface, the light refracting front and rear surfaces of a number of prisms extending at an acute angle to the plane of the prism plate, and for light which is incident parallel to the principal axis of the light beam, the angle of incidence at the rear of the prism plate is substantially equal to the angle of refraction at the front of the prism plate.

4,963,017

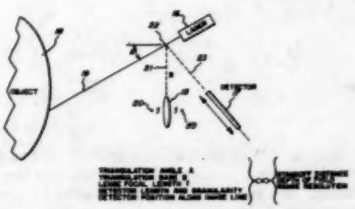
VARIABLE DEPTH RANGE CAMERA

John L. Schneiter, Latham, and Nelson R. Corby, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 1, 1989, Ser. No. 345,750

Int. Cl.[5] G01C *3/08*

U.S. Cl. 356—1 22 Claims



1. A variable depth triangulation ranging system comprising:

a light beam emitting component for generating and directing a light beam toward an object, a linear photodetector component, and an imaging lens component for imaging reflected light onto said linear photodetector component;

at least two of said components being movable, and means for adjustably positioning said movable components such that the light beam, a plane axis through said imaging lens component, and an image line through said linear photodetector component intersect at approximately a common point and satisfy the Scheimflug condition; and

means for calculating system geometry and range from received photodetector signals.

4,963,018

RANGING APPARATUS

Robert N. West, Chislehurst, England, assignor to Sira Limited, Kent, Great Britain

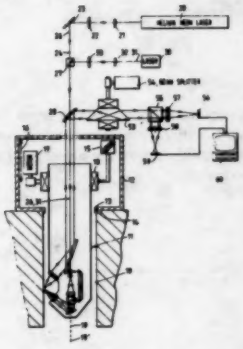
Continuation of Ser. No. 116,314, Nov. 4, 1987, Pat. No. 4,861,984. This application Apr. 21, 1989, Ser. No. 341,595

Claims priority, application United Kingdom, Nov. 10, 1986, 8626812

The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.

Int. Cl.[5] G01C *3/00, 5/00*

U.S. Cl. 356—1 8 Claims



1. Apparatus for measuring the distance from the apparatus to a surface comprising;

optical means for passing a beam of radiation to the surface at an angle other than normal;

optical means positioned to receive said beam of radiation after it has been specularly reflected from the surface;

means for measuring a position of the specularly reflected beam with respect to the optical axis of the second mentioned optical means whereby to indicate the distance from the part of the surface struck by the beam to the apparatus;

and means for scanning said beam across the surface.

4,963,019

GROUNDWATER AZIMUTH DETECTION

John W. Foster, Normal, and Lawrence J. Fryda, Bloomington, both of Ill., assignors to Illinois State University, Normal, Ill.

Filed Jul. 28, 1989, Ser. No. 386,895

Int. Cl.[5] G01P *3/36;* G01W *1/02*

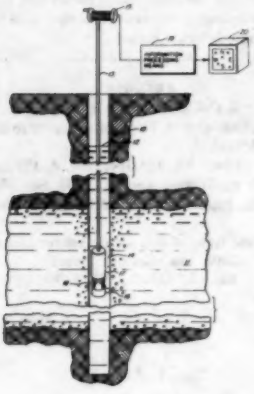
U.S. Cl. 356—28 12 Claims

1. An apparatus for detecting the azimuth of the migration of groundwater containing suspended microscopic particles, the apparatus comprising:

(a) a probe comprising a light source which emits light in a vertical orientation and a photodigitizer which faces the light source and is separated from the light source to permit the flow of groundwater between the light source and the photodigitizer, such that when the probe is sub-

merged in migrating groundwater, the eclipses of light created by the suspended microscopic particles as the groundwater passes between the light source and the photodigitizer are detected by the photodigitizer;

(b) a means to determine the directional orientation of the probe when submerged in migrating groundwater;



(c) a means to process the information from the photodigitizer and from the directional-orientation means; and

(d) a means to visually display the azimuth of the migration of the groundwater.

4,963,020

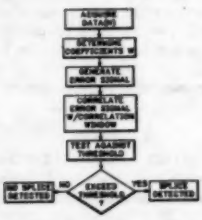
DETECTION OF SPLICES IN AN OPTICAL FIBER

Ajay K. Luthra, Beaverton, and Dean Messing, Aloha, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 5, 1989, Ser. No. 347,709

Int. Cl.[5] G01N *21/88*

U.S. Cl. 356—73.1 **5 Claims**



1. A method of detecting a splice in an optical fiber in the presence of noise comprises the steps of:

applying a nulling filter to a signal received from the optical fiber to remove an exponential from the received signal to produce an error signal; and

applying a correlation filter to the error signal to detect the splice as a dip in the output signal from the correlation filter that exceeds a predetermined threshold.

4,963,021

PHOTOELECTRIC SWITCHING APPARATUS

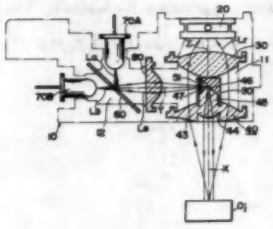
Arata Nakamura, Kyoto, and Saburo Yamamoto, Takatsuki, both of Japan, assignors to Omron Tateisi Electronics Company, Hanazono, Japan

Filed May 6, 1987, Ser. No. 46,333

Claims priority, application Japan, May 6, 1986, 61-104222

Int. Cl.[5] H01H *35/00*

U.S. Cl. 356—153 **4 Claims**



1. A photoelectric switching apparatus comprising:

light projecting means;

photo sensing means;

objective lens means having a double structure comprising an outer peripheral portion and a central portion each of which acts as a lens;

a reflecting surface for deflecting light on an optical axis in the central portion of said objective lens means to the side;

said light projecting means being located on the optical axis of the light which is to be deflected by the reflecting surface, and said photo sensing means being located on the optical axis of the outer peripheral portion of the objective lens means;

wherein an elongated portion, which extends on the optical axis of the central portion of the objective lens means and has said reflecting surface integrally located at the end portion thereof, is formed integrally with the objective lens means; and

wherein a separator covers said elongated portion and a window means is formed in said separator, said window means being arranged on the optical axis of the light which is to be deflected and between the reflecting surface and said light projecting means.

4,963,022

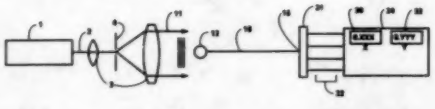
METHOD AND APPARATUS FOR GENERATING A STRAIGHT REFERENCE LINE

Gary E. Sommargren, Santa Cruz, Calif., assignor to Zygo Corporation, Middlefield, Conn.

Filed Oct. 24, 1988, Ser. No. 261,575

Int. Cl.[5] G01C *15/00*

U.S. Cl. 356—247 **42 Claims**



1. A system capable of generating a spatially stable, small diameter light beam for providing a straight reference line over a long distance, said system comprising a source of spatially filtered, collimated light waves, an opaque sphere having a center, said opaque sphere being disposed in the path of said collimated light waves for diffracting said collimated light waves to form said small diameter light beam, said formed small diameter light beam comprising a continuum of high intensity Poisson's spots, said small diameter light beam com-

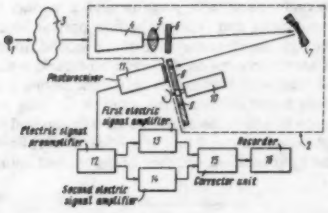
prising said straight reference line having an extension which passes through said center and is normal to said collimated light wave incident on said opaque sphere; means disposed in the path of said formed small diameter light beam for spatially sampling said intensity of a said Poisson's spot at a given location along said path of said formed small diameter light beam; and means associated with said sampling means for determining a position of said sampling means relative to said straight reference line at said given location based on said intensity sampling.

4,963,023

CORRELATIONAL GAS ANALYZER

Viktor L. Goldovsky, ulitsa Shopena, 18, kv. 6, Uzhgorod; Viktor I. Stetsovich, ulitsa Donskaya, 33, Uzhgorod, and Andrei J. Zayats, ulitsa Gagarina, 27a, all of, Uzhgorod, all of U.S.S.R.

Filed Apr. 17, 1989, Ser. No. 339,497
Int. Cl.[5] G01J *3/06, 3/32;* G01N *21/35*
U.S. Cl. 356—308 3 Claims



1. A correlational gas analyzer, comprising:

a light source with the light beam thereof passed through the gas under study featuring a quasiperiodic pattern in the specified spectral band described the number of maxima and minima and pattern pitch;

an optical system positioned downstream of the light beam path after the gas under study with a quasiperiodic pattern of the specified spectral band and comprising:

a condensor;

an input slit iris;

a dispersing element;

an output slit iris rotatably mounted and rotated at a specified speed, this iris configured as a disk with a slit to scan the specified spectral band of the gas under study and configured as an Archimedes spiral with spiral centre coincident with disc centre and spiral pitch approximately equal to the scan length of the specified spectral band of the gas under study with the focal plane of the dispersing elements serves as the scan plane;

a photoreceiver to receive the light beam after passage via said output slit iris;

first electric signal amplifier with input connected to the output of said photoreceiver, designed as a turned amplifier and tuned to a frequency defined by said disc rotation speed and by the number of maxima and minima in the specified spectral band of the gas under study with a quasiperiodic spectrum pattern;

a second electric signal amplifier with input connected to the output of said photoreceiver;

a corrector unit with inputs connected to the outputs of said first and said second electric signal amplifier;

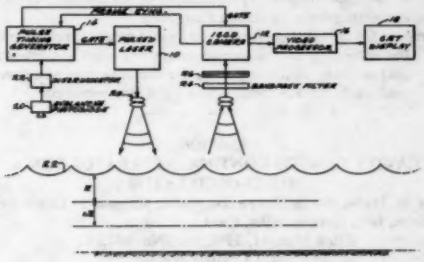
a recorder with input connected to the output of said corrector unit.

4,963,024

METHOD AND APPARATUS FOR DETERMINING K FACTOR

Bobby L. Ulich, Tucson, Ariz., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed Jul. 7, 1988, Ser. No. 216,087
Int. Cl.[5] G01N *21/49*
U.S. Cl. 356—342 25 Claims



1. A method of measuring the diffuse attenuation coefficient or K-factor in a backscattering medium which is at least partially transmitting to light including the steps of:

selectively generating short pulses of light;

projecting said short pulses of light toward the backscattering medium;

detecting said pulses of light reflecting back from said medium after a time delay corresponding to the round-trip propagation time of said light pulses to and from said medium, said pulses of light being detected by at least one camera means, said camera means including automatic gain control means for automatically correcting gain at field rate; and

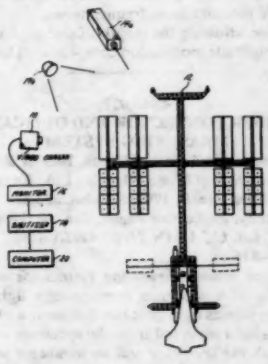
converting said detected pulses of light to determine K-factor.

4,963,025

APPARATUS AND METHOD FOR CALCULATION OF SHAPE FACTOR

James B. Blackmon, and Don Edwards, both of Irvine, Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 12, 1988, Ser. No. 193,044
Int. Cl.[5] G01B *11/00*
U.S. Cl. 356—376 32 Claims



1. A device for measuring the relative amounts of light

leaving the surfaces of an object and computing the shape factors between the surfaces of said object, comprising:

light sensing means for receiving light from said object and measuring its intensity;

identification means, connected to said light sensing means, for referring the intensity of light received from a surface, to the surface from which the light emanated;

means for digitizing, connected to said identification means, to produce a digital representation of the intensity of light emanating from its referred surface;

means for computing, connected to said means for digitizing, for accepting said digitized intensities, said identities of said surfaces, and computing the shape factors associated with each surface from which light was received.

4,963,026

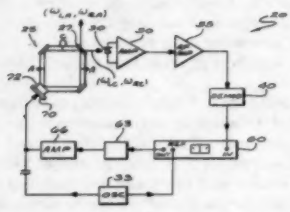
CAVITY LENGTH CONTROL APPARATUS FOR A MULTI-OSCILLATOR

Tae W. Hahn, North Hollywood, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Mar. 14, 1988, Ser. No. 167,512

Int. Cl.[5] G01C *19/64*

U.S. Cl. 356—350 **16 Claims**



1. An apparatus for controlling the length of a multioscillator cavity which sustains a substantially left circularly polarized pair of counter propagating beams of light and a substantially right circularly polarized pair of counter propagating beams of light comprising in combination:

(a) means for mixing beams that propagate in a first direction, one of said beams being substantially left circularly polarized and the other being substantially right circularly polarized;

(b) means for sinusoidally modulating the amplitudes of said beams at a modulating frequency ω_m;

(c) means for detecting the amplitude modulation of said mixed beam pair;

(d) means for detecting the amplitude component of said amplitude modulation at frequency ω_m;

(e) means for adjusting the length of said cavity in response to said amplitude modulation component at frequency ω_m.

4,963,027

OPTICAL FIBER CONNECTOR AND OPTICAL DENSITY MEASURING SYSTEM

Takashi Koizumi, and Tadashi Uekusa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 9, 1989, Ser. No. 363,826

Claims priority, application Japan, Jun. 10, 1988, 63-142959

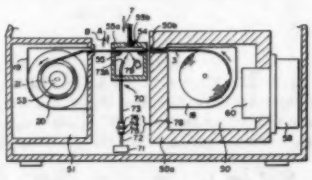
Int. Cl.[5] G01N *21/00*; G02B *6/36*

U.S. Cl. 356—416 **4 Claims**

3. An optical density measuring system for measuring an optical density of a specimen comprising a light projecting means which projects light onto the specimen, a photodetector which detects light reflected from the specimen or light transmitted through the specimen and an incubator which houses said specimen and said photodetector, said light projecting means having a light source and an optical fiber means which transmits light emitted from the light source to the specimen, said optical fiber means having an end extending into said incubator, wherein:

said optical fiber means comprises first and second optical fiber means, each having a light incident end face through which light enters the optical fiber means and a light emanating end face through which the light emanates from the optical fiber means, and an optical fiber connector which connects the first and second optical fiber means,

the optical fiber connector comprising a first optical fiber plug which holds the light emanating end face of the first optical fiber means, a second optical fiber plug which



holds the light incident end face of the second optical fiber means, a plug holder which is mated with both the first and second optical fiber plugs in such a manner that the light emanating end face of the first optical fiber means and the light incident end face of the second optical fiber means are closely opposed to each other, and a stationary optical filter which transmits only light having a selected wavelength and is directly mounted on the plug holder in a position in which the optical filter is interposed between the light emanating end face of the first optical fiber means and the light incident end face of the second optical fiber means.

4,963,028

DENSITOMETRIC SENSING DEVICE FOR USE IN PRINTING PRESSES

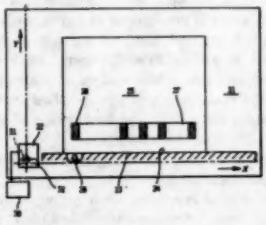
Rolf Braun, Offenbach am Main; Alfred Dorn, Rodgau, and Joachim Muller, Pullach, all of Fed. Rep. of Germany, assignors to MAN Roland Druckmaschinen, Offenbach am Main, Fed. Rep. of Germany

Filed Nov. 8, 1988, Ser. No. 268,744

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1987, 3738850

Int. Cl.[5] G01N *21/00*

U.S. Cl. 356—445 **11 Claims**



1. Apparatus for scanning and measuring the optical density of an ink test strip printed on a sheet, the ink test strip being partitioned into discrete zones corresponding to the ink density of respective zones of print on the printed sheet, the apparatus comprising the combination of:

a supporting surface for the sheet having a guide for positioning the sheet in a first dimension on the surface, and an indicator associated with the guide for locating a first one

of the zones of the test strip at a predetermined location X_s in a second dimension along the guide,

densitometric sensing means including a density measuring head having at least one density measuring receiver disposed to measure light reflected from the sheet,

drive means for the measuring head for translating the measuring head in a first direction parallel to the guide and a second direction perpendicular to the guide,

control means including

first means for traversing the measuring head parallel to the guide to position the measuring head in a predetermined relationship with respect to the indicator for establishing a first starting coordinate X_p,

second means for traversing the measuring head in a direction perpendicular to the guide and cooperating with the densitometric sensing means for positioning the sensing means over the test strip and establishing a second starting coordinate Y_p and

means for initiating a scanning sequence along the test strip of the scanning head as positioned by said second means.

4,963,029

REGISTER-MEASURING SYSTEM

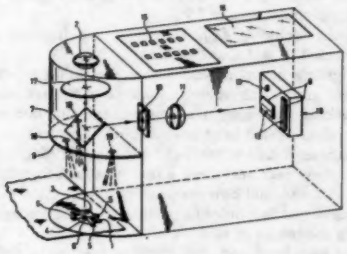
Helmut Kipphan, Schwetzingen, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Jun. 13, 1988, Ser. No. 206,206

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719766

Int. Cl.[5] G01B *11/00*

U.S. Cl. 356—401 **23 Claims**



1. Device for determining a register error in the case of a multi-color print made with a printing press, comprising a hand-held housing containing:

(a) a sight formed in a bottom surface of said housing;

(b) an optical system disposed at a distance from said sight and having an optical axis directed towards said sight;

(c) a mirror disposed between said optical system and said sight for deflecting light reflected from said sight;

(d) a light-receiving unit disposed so as to be irradiated with the light deflected by said mirror; and

(e) an evaluation unit connected to said light-receiving unit for evaluating information from the light received by said light-receiving unit.

4,963,030

DISTRIBUTED-BLOCK VECTOR QUANTIZATION CODER

Anamitra Makur, Bankura, India, assignor to California Institute of Technology, Pasadena, Calif.

Filed Nov. 29, 1989, Ser. No. 443,103

Int. Cl.[5] H04N *7/13*

U.S. Cl. 358—133 **6 Claims**

1. A system for encoding blocks of an image or voice signal comprising

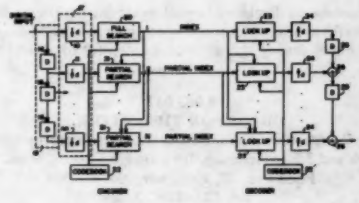
a vector quantization encoding codebook,

means for decimating a block of pixels or samples in digital form of said input signal into subblock vectors by a selected factor d and distributing said subblock vectors through a plurality of channels in a predetermined order,

means for vector quantization coding of said subblocks in ordered sequence of said channels using said encoding codebook in which a number N of stored vectors are ordered, said vector quantization coding means including

a first means in a first one of said ordered channels for making a full search of stored vectors in said codebook to find a best match of a first subblock vector in said first one of said ordered channels and for outputting an index $m^{(1)}$ expressed with a minimum number of bits necessary for the number N of the best match found,

a second means in a second one of said ordered channels for making a partial search over a localized region of stored vectors in said codebook around said index $m^{(1)}$



to find a best match of a second subblock vector in said second one of said ordered channels and for outputting the index $m^{(2)}$ of the best match found, where the index is a number expressed in fewer bits than is necessary for said index $m^{(1)}$ said index $m^{(2)}$ specifying the position of the best match in said localized region as a function of said index $m^{(1)}$, and

an additional means for each ordered channel after said second channel for making a partial search to find a best match of each subsequent subblock vector over a localized region of stored vectors in said codebook around a position that is specified as a function of at least said index $m^{(1)}$ for the best matches of said first subblocks in said first means, and for outputting an index $m^{(i)}$ expressed in fewer bits than is necessary for said index $m^{(1)}$, said index $m^{(i)}$ specifying the position of the best match found as a function of at least said index $m^{(1)}$ for each subsequent subblock i, where i is a number specifying the order of each subsequent block.

4,963,031

CEMENT SLURRY BATCHER APPARATUS AND PROCESS

Ronald O. Brown, Ottawa, Canada, assignor to Alsur Enterprises Ltd., Gloucester, Canada

Filed Jul. 17, 1989, Ser. No. 380,430

Claims priority, application Canada, Aug. 9, 1988, 574245

Int. Cl.[5] B28C *7/04*

U.S. Cl. 366—2 **17 Claims**

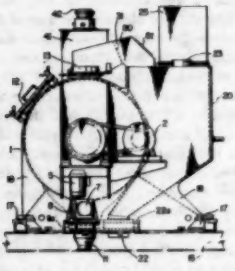
1. A process for discharging, on a batch basis, a predetermined amount of water and a predetermined amount of cement as either a water and cement slurry discharge or as a water and cement discharge and a cement discharge, comprising:

(a) adding a major quantity of said water and a first major quantity of said cement to a slurry mixer to form a primary slurry, and discharging a major portion of said primary slurry from said mixer;

(b) adding the remaining quantity of said water to the remaining quantity of said primary slurry in said mixer to form a secondary slurry, and discharging said secondary slurry from said mixer;

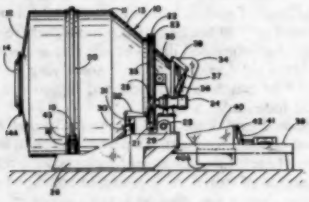
(c) optionally adding any remaining quantity of said cement

to a dry chamber, and discharging said remaining quantity of said cement from said dry chamber; and



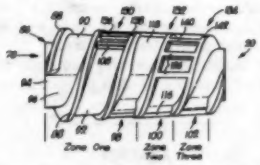
(d) venting air displaced in said mixer during the addition of step (a) to atmosphere and venting air displaced in said dry chamber during the addition of step (c) to atmosphere.

4,963,032
DRUM FOR TILT MIXER
Robert W. Strehlow, New Berlin, Wis., assignor to McNeilus Truck and Manufacturing, Inc., Dodge Center, Minn.
Filed Feb. 22, 1990, Ser. No. 482,926
Int. Cl.[5] B28C *5/20*
U.S. Cl. 366—57 **11 Claims**



1. An improved tiltable rotating mixing drum for mixing erosive materials comprising:
- a relative flat rear conical charging zone having a central change opening for receiving materials to be mixed from a charging chute;
- a front conical zone having a central discharge opening therein for discharging mixed materials;
- a generally cylindrical central zone disposed between said front and rear conical zones;
- a first set of mixing blades disposed in said central zone fixed to the wall of the drum, said blades being substantially configured in the shape of elongated trapezoidal scoops with the longer of the parallel sides disposed toward the charging opening of the drum, said blades being further mounted at an angle with but generally symmetrical with respect to the longitudinal axis of the drum and at a varying angle with respect to the drum wall such that as the drum turns in a generally horizontal position the materials being mixed spill from the scoops along the length of the blades and are generally propelled from the charge end toward the central portion of the drum; and
- a second set of mixing blades disposed in the front conical section of the mixer fixed to the wall thereof, said blades being of a substantially similar shape to those in said first set, said blades being symmetrically disposed about said central discharge opening with the longer of said parallel sides disposed toward said central zone, said second set of blades being mounted at an angle with the longitudinal axis of said drum and at a varying angle with respect to the drum wall such that as the drum turns about a generally horizontal axis the materials being mixed will generally be propelled into the cone falling thereafter back toward said central zone.

4,963,033
SCREW REFINER
Gordon R. Huber, Sabetha, and Lawrence E. Schmelzle, Oneida, both of Kans., assignors to Wenger Manufacturing, Inc., Sabetha, Kans.
Filed Oct. 19, 1988, Ser. No. 260,009
Int. Cl.[5] B29B *1/06*
U.S. Cl. 366—81 **55 Claims**



1. An extruder comprising:
- a head including a casing and structure connected to said casing defining an elongated bore therein having an inlet and an outlet,
- said structure including flighting means presenting a helically-shaped groove for receiving material to be processed; and
- an elongated screw received in said bore and rotatable about its longitudinal axis,
- said screw including a shank portion and flighting means connected to said shank portion,
- said flighting means of said screw presenting a helically-shaped groove for receiving material to be processed and advancing the same in a downstream direction toward said outlet of said head as said screw is rotated,
- said flighting means of said head and said flighting means of said screw each including a first upstream flighting portion and a second downstream flighting portion disposed adjacent said first flighting portion in a direction generally along the length of said bore,
- each of said head and said screw presenting a restricted region having at least one outwardly projecting element extending between said first flighting portion and said second flighting portion of said head and of said screw respectively and disposed in said groove of said head and said groove of said screw correspondingly,
- said at least one element of said screw during rotation of the latter being disposed to pass adjacent said at least one element of said head in order to promote rolling of the material as the same continues to advance in said downstream direction generally toward said outlet.

4,963,034
LOW-DELAY VECTOR BACKWARD PREDICTIVE CODING OF SPEECH
Vladimir M. Cuperman, North Vancouver; Robert Pettigrew, Richmond, and Lloyd Watts, Coquitlam, all of Canada, assignors to Simon Fraser University, Burnaby, Canada
Filed Jun. 1, 1989, Ser. No. 360,023
Int. Cl.[5] G10L *5/00*
U.S. Cl. 381—36 **9 Claims**

1. A method of encoding speech sounds to facilitate transmission of said speech sounds from a transmitter to a remote receiver, and reconstruction of said speech sounds at said receiver, said method comprising the steps of:

(I) at said transmitter:

(a) sampling said speech sounds at discrete intervals to produce a plurality of speech sound samples;

(b) grouping together consecutive sequences of said speech sound samples to produce a plurality of speech sound vectors;

(c) for each one of said speech sound vectors:

(i) sequentially filtering a selected group of a first plurality of prestored excitation vectors through a first filter having preselected filtration parameters;

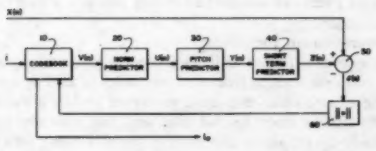
(ii) comparing said speech sound vector with each one of said selected group of filtered excitation vectors;

(iii) selecting one of said filtered excitation vectors which most closely approximates said speech sound vector;

(iv) transmitting to said receiver an index representative of the location, within said first plurality of prestored excitation vectors, of said selected excitation vector; and,

(v) filtering said selected excitation vector through said first filter;

(d) periodically deriving, by backward predictive analysis of a filtered series of said excitation vectors previously selected during step (I)(c)(iii), a particular combination of said filtration parameters which, when applied to said



first filter, while a particular one of said selected excitation vectors is filtered through said first filter, causes said first filter to produce an output signal z(n) which most closely approximates the particular one of said speech sound vectors for which said particular excitation vector was selected; and,

(e) applying said derived filtration parameters to said first filter as said preselected filtration parameters;

(II) at said receiver:

(a) recovering said selected excitation vector from a location, defined by said index, within a second plurality of prestored excitation vectors identical to said first plurality of excitation vectors;

(b) with the same periodicity at which step (I)(d) is performed, concurrently periodically deriving said particular combination of said filtration parameters by said backward predictive analysis of a filtered series of said excitation vectors previously recovered by said receiver, and identical to said series of said excitation vectors selected during step (I)(c)(iii);

(c) applying said particular combination of said filtration parameters to a second filter identical to said first filter; and,

(d) filtering said recovered excitation vector through said second filter.

4,963,035

FISH SORTING MACHINE

Kevin McCarthy, and Patrick DeBourke, both of St. John's, Canada, assignors to Grove Telecommunications Ltd., Newfoundland, Canada

Filed Jun. 29, 1988, Ser. No. 213,163

Claims priority, application Canada, Feb. 29, 1988, 560139

Int. Cl.[5] G60K 9/00

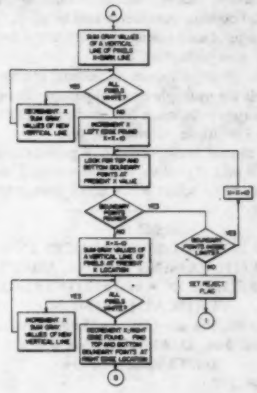
U.S. Cl. 382—28 **18 Claims**

1. Means for sorting fish comprising:

(a) means for receiving an image of a fish in a video camera,

(b) means for receiving the image from the camera and for storing it in an image plane memory,

(c) means for determining stored values of the width of the fish along lines perpendicular to the principal axis of the fish, and stored values of the position of the first and last one of said lines along said principal axis which intersect said image,



(d) means for determining the positions of midpoints between determined width boundary values, and for determining a length of lines joining said midpoints,

(e) means for summing the length of said lines to determine the length of the fish.

4,963,036

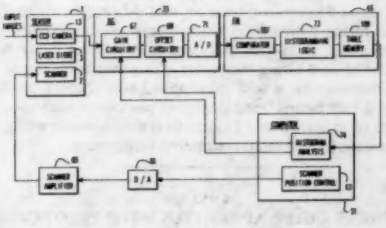
VISION SYSTEM WITH ADJUSTMENT FOR VARIATIONS IN IMAGED SURFACE REFLECTIVITY

Robert A. Drisko, Monroeville, and Jeffrey D. Taft, Plum Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 22, 1989, Ser. No. 327,077

Int. Cl.[5] G06K 9/00

U.S. Cl. 382—50 **23 Claims**



1. A vision system which accommodates to varying reflectivities of a target surface, said system comprising:

light source means directing a beam of light at the target surface;

video camera means having an array of pixels which convert light from said light beam reflected from said target surface into an analog electrical signal representing an image of the light beam on the target surface;

analog to digital conversion means converting said analog signal into a digital signal containing digital values corresponding to light intensity at each pixel of said array;

means analyzing said digital values and selecting one of at least two levels of a control parameter as a function of said analysis;

means responsive to the selected level of said control parameter to adjust said digital value;

wherein said analyzing means includes means generating histogram data from said digital values for each pixel;

a computer having storage means storing said at least two levels of said control parameter and being programmed to select said one of said levels of said control parameter as a function of said histogram data;

said computer storage means including means for storing sets of levels for multiple control parameters and comprising at least two bins, each bin storing a selected level for each of said multiple parameters; and

wherein one of said multiple control parameters is a threshold level for said digital values and wherein said computer is programmed to select a bin using histogram data.

4,963,037

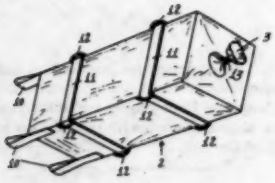
CONTAINER FOR LOOSE PRODUCTS IN GENERAL, PROVIDED WITH RAISING MEANS, ADAPTED TO BE STORED EITHER IN A HORIZONTAL OR IN A VERTICAL POSITION

Giancarlo Manerba, Via per Cittiglio, Laveno Mombello, Italy

Filed Jun. 23, 1989, Ser. No. 370,531

Int. Cl.[5] B65D *33/14*

U.S. Cl. 383—24 **3 Claims**



1. A parallelepipedal container for loose products, comprising a non woven fabric, elongated parallelepipedal holding body, said holding body being defined by two opposite bases and by longitudinal sides coupling said bases, said longitudinal sides having each a substantially flat outer surface, one of said base having a closable loose material loading inlet and the other of said bases having a closable loose material discharging outlet, first lifting closed loop strip means being formed at said one base to be engaged by lifting means for lifting said container as said container rests on said other base thereof and second lifting closed loop spaced strap encompassing means encompassing at spaced positions said holding body to be engaged by said lifting means for lifting said container as said container rests on a said longitudinal side thereof, strap restraining ring means being moreover associated with the outer surface of at least a said longitudinal side for restraining said strap means in said strap restraining ring means.

4,963,038

LINEAR GUIDE APPARATUS WITH PROTECTOR

Yoshio Asano, Maebashi, and Masaru Hattori, Gunma, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1989, Ser. No. 408,239

Claims priority, application Japan, Sep. 29, 1988, 63-127922[u]

Int. Cl.[5] F16C *33/72, 29/06*

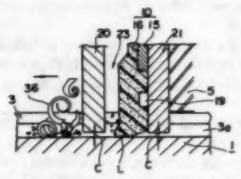
U.S. Cl. 384—15 **3 Claims**

1. In a linear guide apparatus including:

a guide rail extending axially and having ball rolling grooves respectively formed in outer side surfaces in an axial direction,

a slider main body movably straddling said guide rail and having ball rolling grooves formed in inner surfaces of both side walls, the ball rolling grooves of said slider main body respectively corresponding to the ball rolling grooves of said guide rail, said slider main body further formed with ball return paths respectively penetrating both the side walls axially in parallel with the ball rolling grooves,

end caps respectively joined to opposite ends of said slider main body, each of said end caps having a pair of ball return paths for communicating corresponding ones of the ball return paths and the ball rolling grooves with each other,



dust seals respectively attached to axial end surfaces of said end caps, and

a plurality of balls rollably fitted into the ball rolling grooves of said guide rail and the ball rolling grooves of said slider main body,

the improvement comprising:

an outer protector and an inner protector sandwiching each of said dust seals at front and rear sides of said dust seal, each of said outer and inner protector having a substantially similar shape to said dust seal, said dust seal sandwiched by the outer and inner protectors being attached to said slider main body, said outer protector being attached to said slider main body through a spacer forming a minute gap between said outer protector and the front surface of said dust seal.

4,963,039

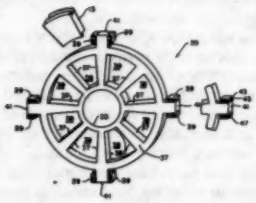
VIBRATION REDUCING THRUST BEARING

Thomas L. Daugherty, Arnold, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 13, 1989, Ser. No. 406,410

Int. Cl.[5] F16C *27/08, 17/06*

U.S. Cl. 384—224 **18 Claims**



1. A thrust bearing for reducing vibration between a rotating collared shaft and a relatively stationary platform, comprising:

a thrust shoe carrier further comprising an inner ring, an outer ring and a plurality of radially extending members interconnecting said inner ring and said outer ring, said shoe carrier mounted in said platform with a damped spring system that simultaneously provides properties of high stiffness in radial and torsional directions with respect to said shaft and low stiffness in the axial direction of said shaft; and

a plurality of thrust shoes mounted in said carrier, said shoes adapted to apply thrust in a direction substantially along the axis of said shaft, said shoes responsive to forces from a driving system.

4,963,040

HEAT-RESISTANT BALL BEARING

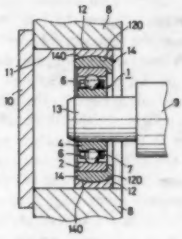
Hiroaki Takebayashi; Kouichi Yamauchi, and Koji Naruse, all of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Continuation of Ser. No. 236,994, Aug. 26, 1988, abandoned. This application Mar. 21, 1990, Ser. No. 497,751

Claims priority, application Japan, Aug. 26, 1987, 62-129395; Nov. 7, 1987, 62-281814[U]

Int. Cl.[5] F16C *33/44*

U.S. Cl. 384—492 14 Claims



1. A crown shaped ball retainer suitable for a heat-resistant deep groove ball bearing, comprising:

a cylindrical retainer body made of one-piece carbon graphite and having a plurality of ball receiving pockets positioned within said retainer body and a plurality of corresponding slots extending axially from said pockets to one side of said retainer body, the diameter of said slots being smaller than the diameter of said balls.

4,963,041

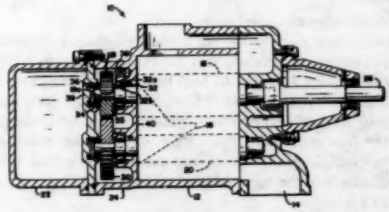
BEARING MOUNTING WITH SELF-COMPENSATION FOR THERMAL EXPANSION

Brian D. Sowards, Mocksville, N.C., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Oct. 2, 1989, Ser. No. 415,786

Int. Cl.[5] F16C *19/49, 25/00*

U.S. Cl. 384—493 13 Claims



1. A bearing mounting with self-compensation for thermal expansion comprising:

a housing;

a rotor mounted in the housing;

first and second bearing means for rotatably mounting the rotor in the housing, and said first bearing means having an outer race mounted in the housing and an inner race mounted on the rotor and axially movable relative to the outer race, said second bearing means being mounted on an end of the rotor; and

means for resiliently maintaining the inner race in engagement with the outer race during relative axial movement between the inner and outer races caused by varying thermal expansion rates between the housing and the rotor.

4,963,042

HORIZONTAL LINE POSITION ADJUSTING IN FRAME PROCESSING DEVICE

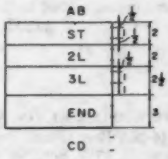
Yasushi Kawakami, Nagoya; Keiichi Hirata, Kuwana; Mizuho Kamisaka, Nagasaki; Miyako Mukai, Nagoya; Tomohiro Ban, Iwakura, and Minoru Ooishi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 27, 1989, Ser. No. 328,640

Claims priority, application Japan, Mar. 26, 1988, 63-72258

Int. Cl.[5] B41J *29/26*

U.S. Cl. 400—17 11 Claims



1. A text processing device comprising represent means for representing text data having at least a plurality of rows with a frame surrounding said text data, which comprises;

vertical rule lines designate means for designating start and end positions of vertical rule lines of said frame based upon the highest position and the lowest position of the text data to be surrounded by said frame,

position designate means for automatically designating positions of horizontal rule lines to be located at the middle of two rows adjacently positioned; and

side edge designate means for designating left and right edge positions of said frame.

4,963,043

PRINTER

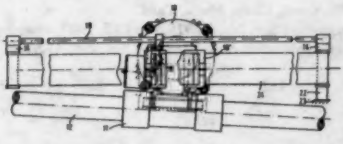
Heinrich Durr, Wilnsdorf, and Manfred Adamek, Kirchen-Freusburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 1, 1989, Ser. No. 345,390

Claims priority, application Fed. Rep. of Germany, May 3, 1988, 3814926

Int. Cl.[5] B41J *32/00, 35/22*

U.S. Cl. 400—196 10 Claims



1. In a printer comprising a housing and a print head carriage including a print head secured to the carriage for displacement in a given print direction, an ink ribbon cassette construction adapted to be releasably secured to the housing, said construction including and ink ribbon storage cassette, a pair of spaced guide arms secured to the cassette for guiding the ribbon supplied by the cassette, an ink ribbon fork for supporting the ribbon between said arms, said fork being secured to the carriage for displacement therewith in said given print direction, the improvement therewith comprising:

means for pivotally securing the cassette and the arms secured thereto to said housing for rotation about an axis in a first mode;

a guide rod secured to the arms spaced from the cassette and parallel to said axis;

means for pivotally and longitudinally displaceably securing the fork to the rod between the arms;

drive means secured to the carriage for transversely displacing the fork relative to said given direction and to said carriage in said first mode, said arms and cassette pivoting about said axis in response to said transverse displacing; and

means secured to the cassette and adapted to be selectively positioned so as to mate with and abut the housing in a second mode to thereby fixedly position the cassette, rod and arms relative to said housing such that the ribbon fork guide rod is obliquely oriented relative to said given print direction in said second mode, said arms and rod being so obliquely oriented in said second mode to cause the ribbon guided thereby to traverse a path through said fork in a direction oblique to said given print direction.

4,963,044

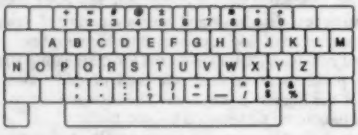
TYPEWRITER KEYBOARD

Samuel R. Warner, 16-N Village Green, Budd Lake, N.J. 07828

Filed Sep. 22, 1989, Ser. No. 411,008

Int. Cl.[5] B41J *5/10*

U.S. Cl. 400—486 **4 Claims**



1. In a keyboard layout having non-shift and shift modes, the improvement which consists of disposing (i) the letters, (ii) the numbers 0 to 9, and (iii) the punctuation marks within a total of four horizontal rows, the letters being disposed on first and second contiguous rows in alphabetical order from left to right with respect to all other letters on each of said rows, the numbers 0 to 9 being disposed on a third of said four rows, and the punctuation marks being disposed on a fourth of said four rows.

4,963,045

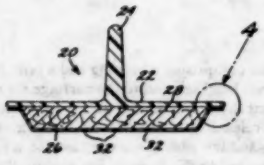
DISPENSER-APPLICATOR FOR SPREADING SUBSTANCES

Nancy A. Willcox, Costa Mesa, Calif., assignor to The Willcox Family Trust, Costa Mesa, Calif.

Continuation of Ser. No. 50,910, May 15, 1987, abandoned. This application Sep. 27, 1989, Ser. No. 413,236

Int. Cl.[5] B65D *85/74*

U.S. Cl. 401—132 **25 Claims**



1. A dispenser-applicator for dispensing a substance contained therein to a receiving surface and for spreading the substance on the receiving surface, the dispenser-applicator comprising:

a substantially rigid base having a generally continuous smooth surface grippable handle means; and

a thin flexible substantially impervious plastic film sealed to the base so as to form a sealed collapsible pocket between the film and the surface of the base for containing the substance;

wherein the thin flexible plastic film is adapted to contact the receiving surface and has at least one aperture for dispensing the substance therethrough and onto the receiving surface by application of pressure on the base to collapse the pocket between the surface of the base and the receiving surface; wherein the film is positioned on the base such that as the pocket collapses the film moves toward the surface of the base and wherein the film is sufficiently thin and flexible such that (a) the film itself provides no significant resistance to the pressure applied to the base and essentially all pressure applied to the base transfers to the substance in the pocket, (b) the film conforms to the shape of the substance in the pocket when pressure is applied and remains in the shape of the substance in the pocket when the pressure is released and (c) the film distributes the applied pressure over the receiving surface and spreads the substances on the receiving surface of the dispenser-applicator is moved across the receiving surface.

4,963,046

TOOTHBRUSH

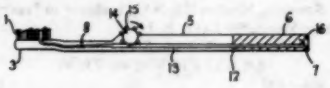
Yasuteru Eguchi, Funabashi, Japan, assignor to Kao Corporation, Tokyo, Japan

Filed Apr. 28, 1988, Ser. No. 187,262

Claims priority, application Japan, May 13, 1987, 62-71078; May 27, 1987, 62-80670

Int. Cl.[5] B43K *5/04*

U.S. Cl. 401—160 **6 Claims**



1. A toothbrush comprising:

a brush base portion having bristles implanted thereon and projecting therefrom, said brush base portion having a fluid outlet adjacent to said bristles, said bristles having diameters in the range of from 6/1000 to 15/1000 inch, at least 80% of said bristles having enlarged spherical tips at the free ends thereof remote from said base portion, the ratio of the diameter of said enlarged spherical tips/the diameter of the remainder of said bristles being from 1.1/1 to 2.5/1;

an elongated grip portion connected to and extending away from said base portion, said grip portion having a storage chamber therein for storing a fluid therein, said grip portion comprising a handle having an elongated, separable portion attached thereto, said separable portion defining said storage chamber;

means including a flexible tube in said handle providing a communicating passage extending from said storage chamber in said grip portion to said fluid outlet; and feeding means comprising a rotatable disc mounted on said handle and having a series of spaced-apart projections on its circumference which projections intermittently press against said tube when said rotatable disc is rotated for feeding the fluid from said storage chamber through said communicating passage to said fluid outlet.

4,963,047
DISPENSING BRUSH

Robert A. Trotta, Pembroke, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Apr. 5, 1990, Ser. No. 504,934
Int. Cl.[5] A46B *11/04*
U.S. Cl. 401—183 14 Claims

1. A two piece brush for dispensing and applying a material in gel form comprising:

a brush element having a plurality of bristles provided on the top surface thereof;

an opening formed in said top surface of said brush element extending therethrough to a bottom surface thereof;

an elongated handle pivotably secured to said brush element for movement from a position substantially at right angles to said brush element top surface to a position adjacent said brush element bottom surface, said handle comprising:

means for retaining the material therein having wall structure forming an opening into said retaining means, said opening in said handle wall structure being positioned for alignment with said opening in said top surface of said brush element with said handle positioned substantially at right angles to said brush element top surface; and

means disposed on said brush element for sealing engagement with said opening in said handle wall structure with said handle positioned adjacent said brush element bottom surface.

4,963,048
NOTE PEN DEVICE

Paul R. Thomas, and William J. Scott, both of Taylorville, Ill., assignors to Notepen, Inc., Okla.

Filed Oct. 28, 1987, Ser. No. 113,445
Int. Cl.[5] B43K *29/12, 31/00*
U.S. Cl. 401—195 15 Claims

1. A combination writing instrument and note paper dispensing device, comprising:

an elongated barrel having a writing portion and a paper dispensing portion;

a writing instrument carrier and a writing point supported by said carrier, said carrier being disposed in the writing portion of said barrel for movement between a first position in which said writing point is extended from said barrel for writing and a second position in which said writing point is retracted into said barrel;

said paper dispensing portion being disposed to receive only at least one paper roll inside said barrel;

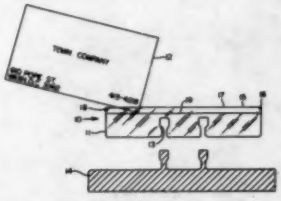
a paper dispensing slot formed in said barrel for permitting unrolling of paper from said paper roll through said slot; and

operator means for operating said carrier between said first and second positions, said operator means extending through and slidably received in an elongated operator slot in said barrel, said elongated operator slot and said paper dispensing slot being connected and aligned to provide a continuous slot permitting movement of said carrier and operator means through the paper dispensing portion to a third position to move said paper roll in said barrel in an axial direction.

4,963,049
BUSINESS CARD FILING ATTACHMENT

Herbert C. Pearson, 5429 Mohican Rd., Bethesda, Md. 20816

Filed Mar. 17, 1989, Ser. No. 324,712
Int. Cl.[5] B42F *19/04*
U.S. Cl. 402—79 9 Claims

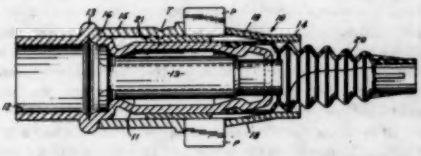


1. A business card filing attachment for a card index file comprising an elongated strip of flat material having a pair of substantially parallel longitudinal edges and having a length substantially equal to that of a business card, there being a pair of openings in one of said longitudinal edges having predetermined shapes and spacing there between for attaching to a card index file, and a pair of contiguous opposed flanges on the other of said longitudinal edges of said elongated strip having outer free edges and having sufficient rigidity and resiliancy to provide good frictional engagement with respect to a business card inserted there between.

4,963,050
SPRING CLIP CABLE SUPPORT ASSEMBLY

Robert O. Wendt, Adrian; Steven T. Holt, Clayton, and Gordon L. Schneider, Westland, all of Mich., assignors to Babcock Industries Inc., Fairfield, Conn.

Filed Mar. 16, 1989, Ser. No. 324,308
Int. Cl.[5] F16D *9/00*
U.S. Cl. 403—197 6 Claims



1. The method of assembling a clip cable support assembly for use with a cable comprising an outer conduit and an inner flexible strand extending through the conduit comprising an inner tubular body having a contacting portion and having an opening therethrough and a radial flange thereon, a tubular spring clip having a free edge and pressed about a portion of the body, a collar having ends extending about a portion of the spring clip and having a first end engaging said radial flange and second end adapted to engage a support, said spring clip

including spring fingers adapted to engage the other side of the support, said method comprising

forming the length of the contacting portions of body in the spring clip such that the free edge of the spring clip is spaced from the radial flange and is adapted to be positioned in a plurality of longitudinal positions during assembly to accommodate supports of different thickness,

positioning a spacer of the desired thickness corresponding to that of the intended support on which the spring assembly is to be mounted between the other end of the collar and ends of the spring fingers,

moving the spring clip and the collar axially toward one another to bring the collar and fingers into contact with the spacer, and

interconnecting the collar, spring clip, and body.

4,963,051

DOWEL FASTENING DEVICE

Gerhard P. Hutter, 993 Lake Ave., Greenwich, Conn. 06830

Filed Jul. 3, 1989, Ser. No. 375,280

Int. Cl.[5] F16B *7/00*

U.S. Cl. 403—298 **3 Claims**

1. A dowel device for connecting and securing a structure together by adjacent wooden elements each having a drilled hole aligned with the adjacent drilled hole: comprising an elongated shank member of rectangular section provided with a plurality of rows of triangular-shaped pivoting members, each pivoting member having two straight sides connected at a point to a side of said shank and a curvilinear top gripping surface, said shank member being inserted in the drilled holes of said adjacent wooden elements to connect the same whereby said gripping surfaces of said pivoting members securely engage the walls of said respective drilled holes when a force is exerted on said dowel device to withdraw the latter from at least one of the drilled holes, said dowel device having a row of pivoting members on the top of said shank and a row of pivoting members on the bottom of said shank aligned with said top row, and a row of pivoting members on each of the sides of said shank located sub-stantially perpendicular to the top and bottom rows of pivoting members thereby creating a dowel device in the form of a cross, and the connection points of the pivoting members with the surfaces of the shank terminating at the corners of the shank sides to provide space between each row of pivoting members and the adjacent row thereof and thus allow fracture and removal capability when it is necessary to remove the same from one of the drilled holes.

4,963,052

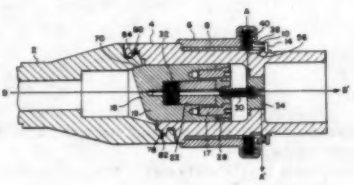
MECHANICAL END JOINT SYSTEM FOR CONNECTING STRUCTURAL COLUMN ELEMENTS

Harold G. Bush, Yorktown; Martin M. Mikulas, Jr., Poquoson, and Richard E. Wallsom, Williamsburg, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 388,264, Aug. 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 223,122, Jul. 22, 1988, abandoned. This application Mar. 30, 1990, Ser. No. 501,910

Int. Cl.[5] B25G *3/18*; F16B *21/00*

U.S. Cl. 403—322 **6 Claims**



1. A mechanical end joint system for connecting structural column elements and providing a primary lock eliminating the possibility of free movement between joint halves during loading or vibration, comprising:

a node joint body having a cylindrical engaging end;

a column end joint body having a cylindrical engaging end;

the cylindrical engaging ends of said node joint body and said column end joint body each having an integral semicircular tongue and an integral semicircular groove;

said node joint body having a conical aperture at the center of cylindrical engaging end thereof;

said column end joint body having an internal latch mechanism housed therein;

said internal latch mechanism having a latch bolt element slidably disposed along the longitudinal axis of said column end joint body at the cylindrical engaging end thereof;

said internal latch mechanism having a spring mechanism disposed along the longitudinal axis of said column end joint body;

said internal latch mechanism having a compressible preload mechanism and plunger means housed therein;

whereby assembly of a joint is accomplished by a transverse force on the column end joint body wherein said slidably disposed latch bolt element is pushed away from said node joint body until the longitudinal axes of the two joint halves become colinear causing:

said spring mechanism to push said slidably disposed latch bolt element against the conical aperture of said node joint body;

said integral semicircular tongue of said column end joint body to mate with said integral semicircular groove of said node joint body;

said integral semicircular groove of said column end joint body to mate with said integral semicircular tongue of said node joint body; and

locking of the mechanical end joint system and adding of a preload across the semicircular tongue and semicircular groove faces is accomplished by compressing said preload mechanism, thereby exerting an equal and opposite force on said latch bolt element and said plunger means and causing said node joint body and said column end joint body to be pressed tightly against each other, effecting a preloaded compressive fit between the two joint halves.

4,963,053

MULTICOMPONENT WALES AND BASES FOR MANHOLE COVER SUPPORTS

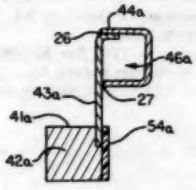
Harold M. Bowman, 18867 North Valley Dr., Fairview Park, Ohio 44126

Continuation-in-part of Ser. No. 207,185, Jun. 15, 1988, Pat. No. 4,872,780, Ser. No. 207,266, Jun. 15, 1988, Pat. No. 4,867,601, Ser. No. 207,326, Jun. 15, 1988, abandoned, and Ser. No. 207,325, Jun. 15, 1988, abandoned, each is a continuation-in-part of Ser. No. 76,668, Jul. 23, 1987, Pat. No. 4,834,574. This application Jun. 6, 1989, Ser. No. 362,257

The portion of the term of this patent subsequent to Sep. 19, 2006, has been disclaimed.

Int. Cl.[5] E02D *29/14*

U.S. Cl. 404—26 **25 Claims**



1. In a manhole cover support for mounting on an existing manhole cover receiving structure and adapted for raising the effective grade thereof, the cover support having a metal body comprising a base portion having a peripheral ledge portion that projects laterally inwardly, a lateral keeper portion that extends from the base portion and rises upwardly from the outer edge of said ledge portion, a reinforcing wale portion having hollow construction formed by at least one discrete piece of metal joined to the keeper portion and projecting outwardly therefrom, the wale portion being spaced vertically from the base portion.

23. In a process for making metal body of an arcuate-in-plan manhole cover support, the body comprising a base portion with a peripheral ledge portion that projects inwardly, a steel lateral keeper portion that extends from the base and rises from the outer edge of the ledge portion, a reinforcing wale portion that is integral with the of the keeper portion and projects outwardly, the wale and/or the base portions being steel box members, the improvement which comprises: forming a substantial part of each said box member of at least one piece of metal that is distinct from the rest of the body structure, and attaching said at least one piece onto the body for completing each box configuration.

4,963,054

FRAMES FOR CONSTRUCTING PAVEMENT BOARDS

Isao Hayashi, 10-15 Kaneaawacho 1-Chome, Hitachi-shi, Ibaragi, Japan

PCT No. PCT/JP88/00928, § 371 Date Apr. 14, 1989, § 102(e) Date Apr. 14, 1989, PCT Pub. No. WO89/03453, PCT Pub. Date Apr. 20, 1989

PCT Filed Sep. 14, 1988, Ser. No. 362,432

Int. Cl.[5] E01C *5/00*

U.S. Cl. 404—34 **3 Claims**

1. A frame for use in forming a paving block, said frame comprising:

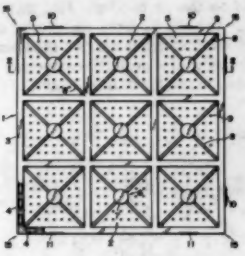
a plurality of side walls defining a plurality of adjacent upwardly open sections;

a bottom in each of said sections and having a plurality of openings therein for draining water therethrough from concrete or mortar poured thereinto;

said side walls each having a plurality of individual through holes therein spaced from each other along the length of said side walls and extending from the upper edges thereof to the bottom and opening out of said frame; and

film means on the upper edges of said side walls for closing the upper ends of said holes and being easily removable for opening said holes;

whereby when concrete mortar is poured into said sections for filling them, said film means can be easily removed to open the upper ends of said through holes for, when the



frames with the concrete or mortar therein are, after the concrete or mortar has hardened, laid side by side with like frames to form paving, the paving is permeable to water which can flow downwardly through said through holes.

4,963,055

PORTABLE REINFORCED ASPHALT TILE

Earnest Sims, Jr., 46 Brunswick Rd., Depew, N.Y. 14043

Filed Jul. 31, 1989, Ser. No. 387,355

Int. Cl.[5] E01C *11/16*

U.S. Cl. 404—41 **15 Claims**

1. A portable, prefabricated, reinforced bitumen composition paving tile, comprising a polygonal body having a top surface, a bottom surface and at least three side surfaces, said polygonal body being formed from a bitumen containing composition and being of a thickness of from about one-half inch to about two and one-half inches, having angularly embedded through about the middle of the thickness thereof and along its length and breadth a support structure, and having extending from each side surface of the polygon body at least one of a continuous upper surface or lower surface interlocking extension, each said extension extending outwardly from the polygonal body of the paving tile a distance about one to about six times the thickness of the paving tile, each said extension having a thickness less than about the thickness of the paving tile at the body of the tile, the thickness of each said extension increasing as its extends outwardly from said polygonal body and said support structure being embedded in each said extension.

4,963,056

EXPANSION JOINT AND METHOD OF MANUFACTURE

Jaroslav Cihal, Hranice na Morave, Czechoslovakia, assignor to Okresní správa silnic Prerov, Prerov, Czechoslovakia

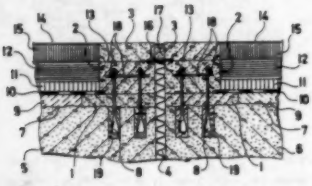
Filed Oct. 12, 1988, Ser. No. 256,438

Int. Cl.[5] E01C *11/02, 11/04*

U.S. Cl. 404—69 **23 Claims**

1. A method for the manufacture of the bridge expansion joint comprising a pair of blocks interconnected with a flexible sealing profile and wherein each of the blocks is formed by at least three vertically stacked layers fabricated of plastic con-

crete compound, said method comprising applying an impregnation coating along the two edges of an expansion gap onto a roughened bridge structure; after fixing the size of the expansion gap, casting the first layers of each block from the plastic concrete compound such that the first layers are of a thickness corresponding to the height of neighboring leveling courses of roadway structure; applying waterproof insulation to the leveling courses and to the parts of the first layers; casting the second layers of the blocks from the plastic concrete compound such that the first layers are of a thickness corresponding to the total height of a protective covering placed on the waterproof insulation and the bearing course of roadway structure; laying on the surfaces of said bearing courses and on the surfaces of said second layers, after the provision of a separator layer, a continuous wearing course of roadway structure; removing said wearing course from the surface of the second layers of the blocks together with the layer of separator, covering the dilatation gap with a flexible sealing profile and coating the surfaces of the second layers with an adhesive film; casting the third layers side-by-side so as to be separated by the gap and to be of such a thickness to equal the height of the running surface of the roadway structure wearing course; and filling the empty portion of the expansion gap between the two third layers by pouring a flexible sealing material therein.



4,963,057

SLUICE GATE FOR AUTOMATICALLY REGULATING A LEVEL

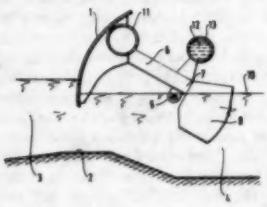
Thierry Fournier, Andilly, France, assignor to Societe Anonyme dite: Alsthom Fluides, La Courneuve, France

Filed Jan. 2, 1990, Ser. No. 459,897

Claims priority, application France, Jan. 3, 1989, 8900028

Int. Cl.[5] E02B 7/20, 7/50

U.S. Cl. 405—93 **8 Claims**



1. A sluice gate for automatically regulating a level of liquid flowing within a channel, the gate comprising:

means for enabling said gate to oscillate about a transverse oscillation axis;

a plate disposed upstream from said oscillation axis in order to close to a greater or lesser extent said channel between a regulated level reach and another reach, said plate being cylindrical in shape about said axis;

a float operatively connected to said plate and dipping to a greater or lesser extent into said regulated level reach in order to raise or lower said plate as a function of variations in the level of said reach; and

adjustable balancing masses for conferring substantially neutral balance on said gate when the level of said regulated level reach is at a reference value;

wherein said gate further includes an adjustment support system for maintaining, on command, an adjustment mass in one or other of at least two adjustment positions situated at a longitudinal distance apart from each other so as to vary said reference level while retaining the substantially neutral character of said balance.

4,963,058

PROTECTIVE BARRIER FOR THE PROTECTION OF OFFSHORE MARINE WORKS, AND METHOD OF INSTALLATION OF THE SAME

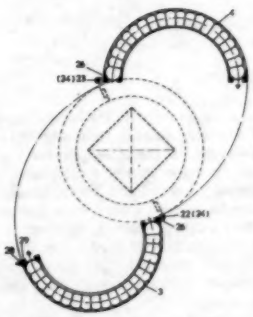
Peter Broughton, Camberlay, England; Jean-Claude Berthin, Mennecy, France; Jean G. M. Martin, Paris, France, and Gerard A. A. Barbaras, La Queue en Brie, France, assignors to Doris Engineering, France

Filed May 15, 1989, Ser. No. 351,797

Claims priority, application France, May 13, 1988, 88 06462

Int. Cl.[5] E02D 23/02, 25/00

U.S. Cl. 405—207 **6 Claims**



1. A protective barrier for marine works, comprising at least two ballastable concrete elements, at least partially surrounding a work to be protected, of greater height than the depth of water in which said barrier is to be installed, said elements having vertical sides comprising a connection device for structural continuity of the elements after assembly, said elements being independent of the work to be protected, wherein the connection device comprises conjugate teeth formed in the external and internal walls of the corresponding vertical sides of the elements to be assembled, coaxial cylindrical channels vertically penetrating the teeth, locking pins located in said channels, and cement slurry injected into joints of the teeth and the cylindrical channels to produce structural continuity of the protective barrier.

4,963,059

ROTARY CUTTING TOOL

Nobuo Hiyama, Utsunomiya, Japan, assignor to Izumo Industrial Co., Ltd., Japan

Continuation of Ser. No. 18,349, Feb. 24, 1987, abandoned. This application Feb. 24, 1989, Ser. No. 317,067

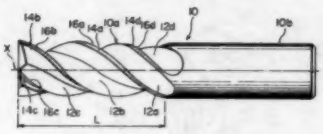
Claims priority, application Japan, Feb. 28, 1986, 61-43459; Sep. 30, 1986, 61-231694; Sep. 30, 1986, 61-231695; Oct. 2, 1986, 61-235413; Oct. 23, 1986, 61-252172

Int. Cl.[5] B23C 5/00

U.S. Cl. 407—60 **22 Claims**

1. In an improved rotary cutting tool comprising a body having a cutting part and an axis of rotation therethrough, said body having an even number of helical flutes formed in a circumferential surface of the cutting part in circumferentially spaced relation to one another and extending helically axially

of the cutting part so as to define an even number of helical lands of a generally uniform land width spaced circumferentially of the cutting part from one another, said body having an even number of helical peripheral cutting edges each defined by a portion of an inner surface of a respective one of the helical flutes facing in a direction of rotation of the body and a surface of the land adjacent to said portion of the inner surface, at least one of said peripheral cutting edges having a helix angle different from helix angles of the other peripheral cutting edges, the improvement comprising:



the even number of peripheral cutting edges being equally spaced circumferentially of the body in at least one plane disposed perpendicular to the axis of rotation of the body, said plane being spaced a distance of about one third of the length of the cutting part from the forward end thereof, the even number of peripheral cutting edges being comprised of a plurality of pairs of diametrically opposite cutting edges, the two peripheral cutting edges of each of said pairs of cutting edges having the same helix angle and thereby being symmetrical with respect to the axis of the body.

4,963,060

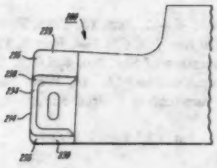
CUTTING INSERT WITH CHIP CONTROL

Kenneth L. Niebauer, and Thomas A. Lockard, both of Raleigh, N.C., assignors to Kennametal Inc., Latrobe, Pa.

Division of Ser. No. 93,348, Sep. 4, 1987, Pat. No. 4,834,592. This application Mar. 27, 1989, Ser. No. 329,146

Int. Cl.[5] B23P *15/28*

U.S. Cl. 407—114 **18 Claims**



1. An improved cutting insert with chip control features comprising an insert body having end wall regions having a predetermined width and defining in part a cutting edge and sides and top and bottom walls generally perpendicular to said sides, said insert body being invertible about an axis perpendicular to said sides thereof, said insert body having cutting edges at said end wall regions, whereby in each inverted position of said insert body a respective cutting edge is presented uppermost at the same end of said insert body, said top and bottom walls of said insert body defining therein a notch; a land region extending rearwardly from a first portion of each said end wall region cutting edge toward said respective top or bottom wall and defining a surface region of a predetermined width, said land region being asymmetrically disposed in said end wall region; a descending wall initiating in a portion of said land and terminating in a planar floor region having a forward, a rearward and opposed side edges and wherein said descending wall terminates at said planar floor's forward and opposed side edges; and a back ramp extending upwardly from said planar floor reward edge and terminating at said respective top or bottom wall and wherein said end wall region further includes a first flat land region of predetermined width adjacent said land region and extending rearwardly from a further portion of said end wall region cutting edge and said first flat land region together with said land region defines the width of the end wall region and wherein the first flat land region width is no more than approximately one-third of said end wall region width.

4,963,061

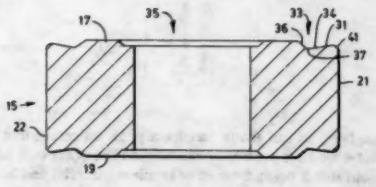
CERAMIC CUTTING INSERT

Karl Katbi, Troy; John H. Patterson, Hazel Park; Tony M. Lowe, Royal Oak; Yefim Val, Troy; Thomas J. Bernadic, Madison Hts., and Brendan L. Brockett, Dearborn Heights, all of Mich., assignors to GTE Valenite Corporation, Troy, Mich.

Filed Apr. 7, 1989, Ser. No. 334,624

Int. Cl.[5] B23B *27/14, 27/22*

U.S. Cl. 407—114 **1 Claim**



1. A ceramic cutting insert comprising silicon nitride or alumina, said insert comprising a pair of substantially parallel spaced apart faces and at least one peripheral side surface, said peripheral side surface being substantially normal to said faces, a beveled cutting edge, said beveled edge has a radius of from about 0.002 to about 0.005 inch and being positioned in a cutting plane wherein said cutting plane is substantially parallel to said face and positioned closely adjacent or at the juncture of one of said faces and said peripheral side surface, an edge strengthening land extending rearwardly of the beveled edge a distance of from about 0.002 to about 0.006 inch and at an angle of from about 105 to about 95 degrees with respect to the peripheral side surface, and a grooved recess extending rearwardly and along said edge strengthening land, said grooved recess includes a shallow descending surface leading to the bottom of said grooved recess and an ascending surface leading to a respective one of said parallel faces and away from the insert and the cutting edge, said descending surface extends downwardly from the strengthened edge at an angle of from about 80 to about 86, said ascending surface extends upwardly at an angle of from about 130 to about 140 degrees to said side surface, said grooved recess including a lowermost position at the juncture of the descending and ascending surfaces, said lowermost portion being positioned rearwardly from the cutting edge a distance of from about 0.04 to about 0.08 inch.

4,963,062

SINGLE-PIECE, PRE-SHAPED ANCHOR

Louis N. Giannuzzi, 59 Dingletown Rd., Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 643,392, Aug. 23, 1984, Pat. No. 4,828,445, which is a continuation-in-part of Ser. No. 388,256, Jun. 14, 1982, abandoned. This application Feb. 2, 1989, Ser. No. 305,077

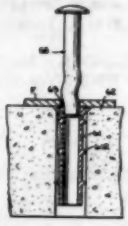
The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[5] F16B *13/06, 15/08, 15/00*

U.S. Cl. 411—45 **25 Claims**

1. A pre-shaped anchor of a kind adapted to be forcibly driven axially into a tightly fitting hole drilled in masonry, so that the anchor makes a strong interference fit therein, said anchor being adapted to support an object at a position adjacent said masonry, said masonry being of a material which if

scored, chiseled or otherwise mutilated by the anchor would alter the shape of the hole wall and thereby weaken the holding power of the anchor; said anchor comprising a drivable element and an elongated shank extending from the element and terminating in a tip, said shank being pre-shaped to have an end portion furthest from the element which extends in the general direction of the longitudinal axis passing through the element and said tip of the shank and to have at least one undulation between the element and said end portion which



creates a bend in the shank having a peak on one side of the shank between base portions generally on the other side of said shank, said shank being formed of resilient material and having a non-abrading bearing surface, so that when it is forcibly driven into said tightly fitting hole it will not score, chisel or otherwise mutilate the hole wall, and said undulation will be forcibly altered by reaction with the wall of the hole, and in seeking to recover its original shape, will frictionally secure the anchor in place.

4,963,063

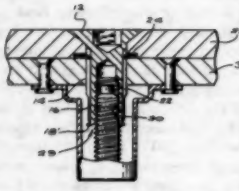
CAPTIVE PANEL FASTENER

Bulent Gulistan, 20568 Pinnacle Way, Malibu, Calif. 90265

Continuation-in-part of Ser. No. 139,628, Dec. 27, 1987, abandoned. This application Nov. 7, 1989, Ser. No. 433,573

Int. Cl.[5] F16B *39/00, 21/18*; B21K *1/44, 1/58*

U.S. Cl. 411—105 **19 Claims**



1. An inexpensive, high strength, captive, panel fastener assembly comprising:

a fastener having a head, a shank and an internally threaded outer end;

said shank, including said internally threaded outer end, having a plurality of external longitudinally extending slots;

a substantially rigid inflexible retention washer having inwardly extending prong means for fitting into said external longitudinally extending slots;

formable end wall means at the outer end of said fastener for blocking the outer ends of said slots and retaining said washer onto said fastener by preventing said washer prongs from sliding off the end of the fastener, and thereby holding the fastener captive in the desired location, said formable end wall means being formed of the same material as, and being integral with the remainder of said fastener; and

the outer diameter of said formable end wall means being equal to or slightly less than the smallest outer diameter of the shank on said fastener.

4,963,064

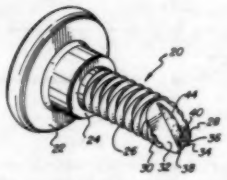
FABRIC FASTENER

Francis C. Peterson, Woodbury, Conn., assignor to Buell Industries, Inc., Waterbury, Conn.

Filed Dec. 12, 1989, Ser. No. 449,591

Int. Cl.[5] F16B *25/00*

U.S. Cl. 411—387 **11 Claims**



1. A fabric fastener, comprising: a fastener head; and a threaded fastener shank having an axis, and

a tip section having a threaded side and an angled side, the intersection of said threaded and angled sides forming an end,

said threaded side being contiguous with and substantially an extension of the threaded shank,

said end having two prongs with a space therebetween, said prongs having a perimeter with inner and outer edges, and being sharp edged over a substantial portion of their perimeters, including at least a portion of the edges of said prongs adjacent said space.

4,963,065

CENTRIFUGAL PUMP FOR PULVERIZED MATERIAL

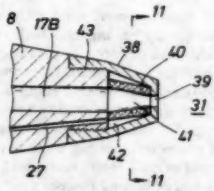
Andrew M. Scott; Bernardus B. Quist, and Teunis Terlouw, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 746,441, Jun. 18, 1985, Pat. No. 4,605,352, which is a division of Ser. No. 699,494, Feb. 8, 1985, abandoned, which is a continuation of Ser. No. 435,011, Oct. 18, 1982, abandoned. This application Mar. 14, 1986, Ser. No. 839,832

Claims priority, application United Kingdom, Nov. 20, 1981, 8135066

Int. Cl.[5] B65G *53/40*

U.S. Cl. 414—217 **3 Claims**



1. A centrifugal pump for continuously feeding pulverized material from a low pressure zone into a high pressure zone, the pump comprising a hollow rotor with a central chamber communicating with a plurality of channels extending toward the outer rim of the rotor, each channel communicating at the outlet thereof with a nozzle, the interior of each nozzle communicating at the bottom end thereof with the outlet of a channel, and at the other end thereof, via a circular opening with the high pressure zone, the central axes of the outlet and the opening coinciding, and a conically shaped wall of continu-

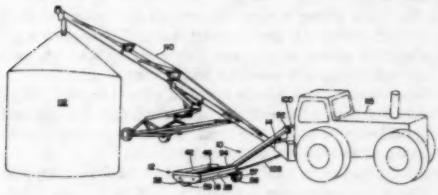
ous porosity being arranged coaxially with respect to the circular opening, which wall extends form the outlet of the channel to the circular opening of the nozzle, the space between the wall of continuous porosity and the wall of the interior of the nozzle communicating with a conduit for the supply of gas.

4,963,066

GRAIN HOPPER ASSEMBLY

Loren P. Boppart, DeKalb, Ill., assignor to Mayrath Industries, Inc., Compton, Ill.

Filed Aug. 15, 1988, Ser. No. 233,477
Int. Cl.[5] B60P *1/40*
U.S. Cl. 414—376 **19 Claims**



1. A grain hopper assembly to receive grain unloaded from a bottom unloading grain transport vehicle, the assembly comprising:

a shell having opposite ends, said shell defining a top opening through which grain is received from a bottom outlet of the grain transport vehicle;

said shell further including a bottom wall and side walls extending up from said bottom wall, and a flexible sealing means, attached to said side walls, for forming a partial seal with the vehicle unloading the grain;

an auger means, mounted to said shell, for conveying grain toward one end of said shell;

a hopper tube having an auger contained therein;

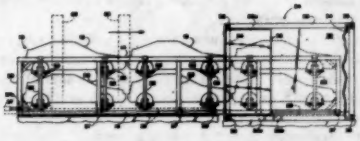
a means, at one end of said shell, for connecting said hopper tube to said shell so that said hopper tube auger operatively communicates with said auger means whereby grain at the one end of the shell is received and conveyed by the hopper tube auger.

4,963,067

SYSTEM FOR LOADING AND TRANSPORTING WHEELED VEHICLES

Peter Gearin, Portland, and Everett A. Leech, Clackamas, both of Oreg., assignors to G & G Intellectual Properties, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 943,688, Dec. 18, 1986, Pat. No. 4,797,049. This application Oct. 24, 1988, Ser. No. 261,504
The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.
Int. Cl.[5] B60P *1/64*; B65D *88/12*
U.S. Cl. 414—400 **2 Claims**



1. A system for transporting wheeled vehicles comprising:

(a) a transporting vehicle;

(b) an elongate three-dimensional frame;

(c) means for supporting a plurlaity of wheeled vehicles within said frame in a condition physically isolated from one another at multiple levels whereby certain vehicles are supported in an elevated condition and other vehicles are supported at levels below said certain vehicles;

(d) an elongate three-dimensional rectangular shaped general purpose cargo-carrying container separate and apart from said frame, said container having a closed top, bottom and surrounding wall, and a selectively openable and closable entry-way forming a weather-sealed enclosure when said entryway is closed;

(e) means for loading wheeled vehicles upon said frame while the frame is separate and apart from said container, and supporting said certain vehicles in elevated condition;

(f) power operated means for moving said frame, while loaded with vehicles, through said entryway and into matingly received condition within said container; and

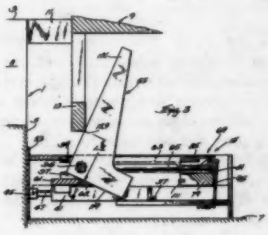
(g) means for securing said container to the transporting vehicle.

4,963,068

TRAILER RESTRAINT

Kenneth M. Gelder, West Bend, Wis., assignor to Systems, Inc., Germantown, Wis.

Filed Jan. 23, 1989, Ser. No. 300,133
Int. Cl.[5] B65G *69/22*
U.S. Cl. 414—401 **30 Claims**



1. Apparatus for restraining a movable member against a stationary member comprising:

a. a housing fixed to the stationary member;

b. shoe means for pivoting about the housing between a closed and a raised position and for linearly sliding within the housing between a first location and a second location, the shoe means being adapted to contact the movable member when in the raised position;

c. means for locking the shoe means in place at the second location thereof within the housing when the shoe means is in the raised position;

d. biasing means for resisting the sliding motion of the shoe means from the first to the second location within the housing; and

e. means for pivoting and linearly sliding the shoe means within the housing.

4,963,069

CONTAINER FOR THE HANDLING OF SEMICONDUCTOR DEVICES AND PROCESS FOR PARTICLE-FREE TRANSFER

Manfred P. Wurst, Stuttgart; Rudolf Simon, Korntal-Muenchingen, and Thomas V. Kahlden, Stuttgart, all of Fed. Rep. of Germany, assignors to Meissner & Wurst GmbH & Co., Stuttgart, Fed. Rep. of Germany

Filed Nov. 6, 1987, Ser. No. 117,737
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1986, 3637880
Int. Cl.[5] B65D *88/74*; H01L *21/68*
U.S. Cl. 414—416 **15 Claims**

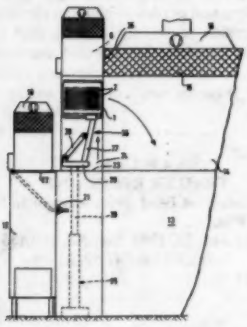
1. Apparatus for the particle-free transfer of articles between a container for such articles and process apparatus including a

clean room for the further processing of such articles, comprising:

(a) carrier means for supporting said articles;

(b) a clean air zone in said container, in which zone the carrier means and articles can be positioned;

(c) first air circulation means for circulating an approximately laminar clean air stream through said clean air zone and past the surfaces of said articles so as to prevent contaminated particle adherence to said articles;



(d) second air circulation means for circulating an approximately laminar clean air stream through said clean room;

(e) said first and second air circulation means directing the respective laminar clean air streams in the same direction in said container and said clean room, and

(f) means for transferring said carrier means with said articles from said container into said clean room in a direction transverse to the direction of laminar flow of said air stream in said container.

4,963,070

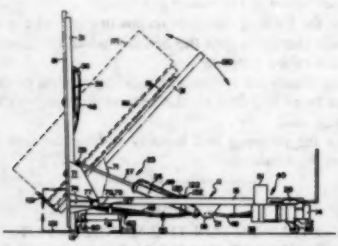
ADJUSTABLE EQUIPMENT RACK CARRIER

John E. Detrick, Vero Beach, Fla., assignor to Southeast Container Corp., Melbourne, Fla.

Filed Aug. 2, 1988, Ser. No. 227,667

Int. Cl.[5] B60P *1/16*

U.S. Cl. 414—492 **6 Claims**



1. A hand-movable, floor-rollable, electronic equipment rack transport apparatus comprising:

a first, generally horizontally extending, support frame, sized to accomodate an electronic equipment rack and supported for rolling and swivel movement on an interior floor of a building by way of a plurality of casters attached thereto;

a second support frame pivotally attached to a first end of said first support frame, so as to be rotatable between a first, horizontal position, at rest on said first support frame, and a second, vertical position adjacent to said first end of said first support frame;

a translatable subframe, having a footmember at one end thereof, supported by said second support frame, so as to be translatable along said second support frame in the direction in which said second support frame is oriented with respect to said first support frame;

a first electrically-powered piston unit pivotally attached to said first and second support frames, for controllably rotating said second support frame about its pivotal attachment to said first support frame;

a second electrically-powered piston unit attached to said translatable subframe and said second support frame for translatably adjusting the position of said subframe along said second support frame;

an electrical power supply support bracket, mounted on a second end of said first support frame, for supporting an electrical power supply unit for operating said first and second electrically-powered piston units;

a movement control handle attached to said second end of said first support frame, through which said first support frame may be rolled, by hand, on its supporting casters along an interior floor of a building; and

means, coupled to said second end of said first support frame, for supporting a counterweight to provide a balancing, stabilizing force at the second end of said first support frame opposite to the first end thereof at which an electronic equipment rack is engaged by said translatable subframe supported on said second support frame.

4,963,071

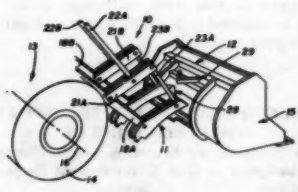
COUPLER ASSEMBLY BETWEEN A PRIME MOVER AND A WORK IMPLEMENT

Renee M. Z. Larwin; Richard D. Keen, Jr., both of Kent, and Joseph R. Zeno, Cuyahoga Falls, all of Ohio, assignors to American Coupler Systems, Inc., Kent, Ohio

Filed Jun. 23, 1989, Ser. No. 370,703

Int. Cl.[5] E02F *3/28*

U.S. Cl. 414—723 **14 Claims**



1. A coupling assembly for demountably attaching a work implement to a prime mover having lifting and tilting mechanisms, said coupling assembly comprising:

a master coupling element adapted to be mounted on the lifting and tilting mechanisms of the prime mover;

an implement coupling element adapted to be attached to a work implement;

said master coupling element having a substantially rectangular frame with upper and lower beam members extending transversely between laterally spaced side plates;

an aligning horn extending upwardly from said upper transverse beam member;

a first, forwardly directed bearing surface extending between said side plates along substantially the entire lateral extent of said upper transverse beam member;

a second, forwardly directed bearing surface extending between said side plates along substantially the entire lateral extent of said lower tranverse beam member;

said implement coupling element having upper and lower, transversely oriented support members;

a receiver presented from said upper support member to be operatively engaged by said aligning horn;

a first, rearwardly directed bearing surface extending fully along said upper support member for a lateral extent substantially equal to the lateral extent of said first bearing surface on said upper transverse beam member of said master coupling element;

a second, rearwardly directed bearing surface extending fully along said lower support member for a lateral extent substantially equal to the lateral extent of said second bearing surface on said lower transverse beam member of said master coupling element;

a locking mechanism relessably to secure said implement coupling element to said master coupling element; and,

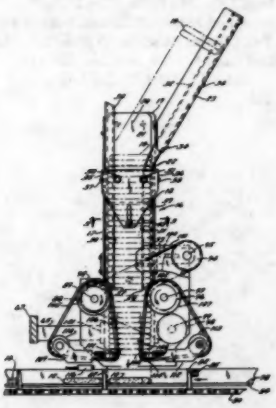
said first and second bearing surfaces on said master coupling element being engaged along substantially the full lateral extent thereof by said first and second bearing surfaces, respectively, on said implement coupling element when said aligning horn is operatively engaged within said receiver and said locking mechanism is securing said implement coupling element to said master coupling element.

4,963,072

FEEDER FOR SHAPE UNSTABLE ARTICLES

Guy M. Miley, Lake Worth, and Daniel J. McGuire, Fort Lauderdale, both of Fla., assignors to Curt G. Joa, Inc., Boynton Beach, Fla.

Filed Aug. 24, 1989, Ser. No. 397,863
Int. Cl.[5] B65G 59/06
U.S. Cl. 414—797.6 6 Claims



1. A machine for feeding soft, pliable articles having an unstable shape, comprising:

a hopper having a top opening for input of said articles and a downwardly facing bottom opening for outflow of said articles,

first and second similar pulley shaving a plurality of peripheral grooves and rotatable about parallel axes and laterally spaced apart by a predetermined distance in a common horizontal plane adjacent said bottom opening such that the space between said pulleys is in vertical alignment with said bottom opening,

third and fourth similar pulleys having a plurality of peripheral grooves corresponding to the grooves in the first and second pulleys and rotatable about parallel axes lying in a common horizontal plane and laterally spaced apart by a distance less than said predetermined distance by which said first and second pulleys are spaced apart, the third and fourth pulleys being arranged below the first and second pulleys and the space between said third and fourth pulleys being substantially aligned with the space between the first and second pulleys,

a first plurality of round belt means running over said first pulley in the respective grooves thereof and downwardly to over said third lower pulley in the respective grooves thereof and a second plurality of round belt means running over said second pulley in the respective grooves thereof and downwardly over said fourth lower pulley in the respective grooves thereof, said first and second plurality of belt means converging toward each other in the downward direction to define a generally v-shaped passageway into which articles from said hopper settle and at least the lowermost article is frictionally engaged directly between sides of the two pluralities of belt means between the lower third and fourth pulleys,

motor means operatively coupled to said pulleys for driving said pulleys rotationally, and

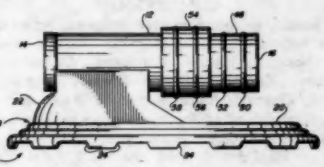
means for causing said motor means to run repeatedly to cause said belt means to translate by an amount sufficient to dispense only the lowermost article from between the lower pulleys under the frictional influence of the belts and then to stop running.

4,963,073

WATER PRESSURE OPERATED WATER PUMP

George Tash, 5777 Balcom Canyon, Somis, Calif. 93021, and Warren Hartmann, 337 Emma Ave., Ventura, Calif. 93003

Filed Nov. 25, 1988, Ser. No. 275,858
Int. Cl.[5] F04F 5/44
U.S. Cl. 417—181 2 Claims



1. A pump for pumping water from a reservoir through an outlet hose, comprising:

(a) an essentially cylindrical pump body having an inlet end and an outlet end, said inlet end for connection to a source of water under pressure, said outlet end for connection to said outlet hose;

(b) an annular wall located in said cylindrical pump body nearer said inlet end of said cylindrical pump body than said outlet end of said cylindrical pump body;

(c) a reduced diameter venturi mounted in the interior of said cylindrical pump body and located near said inlet end of said cylindrical pump body, the reduced diameter end of said reduced diameter venturi being directed toward said outlet end of said cylindrical pump body, wherein said reduced diameter venturi is mounted on the side of said annular wall facing said outlet end of said cylindrical pump body, said reduced diameter venturi being in fluid communication with said inlet end of said cylindrical pump body through the center of said annular wall;

(d) a hollow cylindrical insert affixed in place in the interior of said cylindrical pump body near said pump outlet, said cylindrical insert for restricting the flow through said cylindrical pump body, said cylindrical insert including an annular ring located centrally therein which, together with said cylindrical insert itself, serves to slightly narrow the aperture through said cylindrical pump body near said outlet end thereof;

(e) a pumping chamber located in said cylindrical pump body between said reduced diameter venturi and said restricting means;

(f) a reservoir inlet aperture located in the side of said cylindrical pump body, said reservoir inlet aperture being in fluid communication with said pumping chamber, said reservoir inlet aperture for allowing water in said reservoir to be drawn into said pumping chamber and out of said pump through said outlet hose;

(g) a hollow base, said cylindrical pump body being mounted on said hollow base, the interior of said hollow base being in fluid communication with said reservoir inlet aperture in said cylindrical pump body;

(h) wherein said hollow base comprises:

(1) a hollow oval-shaped footing member open on the bottom thereof, wherein said oval-shaped footing member has a plurality of notches around the sides at the bottom thereof, which notches are designed to admit water into the interior of said hollow oval-shaped footing member;

(2) a neck member located on the top of said oval-shaped footing member and at one end thereof, said cylindrical pump body being mounted on said neck member near the end of said cylindrical pump body having said pump inlet; and

(3) a hollow, essentially cylindrical segment mounted in the interior of said neck member, the top of said cylindrical segment being in fluid communication through said reservoir inlet aperture with said pumping chamber, the bottom of said cylindrical segment extending downwardly into said oval-shaped footing member, and being open to allow water to be drawn into it.

4,963,074

VARIABLE DISPLACEMENT SWASH-PLATE TYPE COMPRESSOR

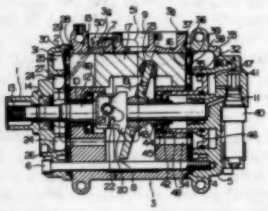
Masami Sanuki, Kariya; Fumihiro Itoigawa, Nagoya; Akikazu Kojima, Gamagori; Mitsuo Inagaki, Okazaki; Masanori Yasuda, Okazaki; Yoshiki Kurokawa, Okazaki; Kazuhito Miyagawa, Kariya; Seiichiro Suzuki, Nagoya; Shigeki Iwanami, Okazaki; Shiro Kawasaki, Anjo, and Nobuhiro Miura, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed Jan. 4, 1990, Ser. No. 293,434

Claims priority, application Japan, Jan. 8, 1988, 63-1835; Feb. 29, 1988, 63-46746; Mar. 11, 1988, 63-58691; May 14, 1988, 63-117987; May 23, 1988, 63-125183

Int. Cl.[5] F04B *25/04*

U.S. Cl. 417—222 **14 Claims**



2. A variable displacement swash plate type compressor comprising:

a shaft;

a cylinder housing for defining a swash plate chamber and a plurality of cylinder bores each of which extends around said shaft in parallel thereto;

a swash plate provided in said swash plate chamber, mounted on said shaft for rotation therewith, and inclined relative to said shaft;

pistons slidably inserted into said cylinder bores, respectively, for defining pairs of working chambers in cooperation with said cylinder bores at both ends of said pistons, each of said pistons being connected to said swash plate and being reciprocated in accordance with a swing motion concomitant with rotation of said swash plate for sucking fluid to said pairs of working chambers, compressing the fluid in said working chambers and discharging the fluid from said working chambers;

support means for supporting said swash plate so as to be swingable relative to said shaft and to be movable in an axial direction of said shaft, thereby selectively varying inclination of said shaft and shifting a center of rotation of said swash plate along said shaft;

suction chambers respectively arranged adjacent to said pairs of working chambers;

suction passage means for supplying the fluid through said swash plate chamber to said suction chambers; and

a bypass passage bypassing said swash plate chamber for communicating said suction passage means and the suction chamber located on a first side of said shaft;

whereby, when the inclination of said swash plate is decreased and the center of rotation of said swash plate is shifted so that substantially no suction, compression and discharge of the fluid is completed in the working chambers located on said first side of said shaft to decrease displacement of the compressor, the fluid is recirculated through said bypass passage into said suction chamber located on said first side responsively to a flow of the fluid into said working chambers on a second side of said shaft, thereby lubricating and cooling sliding parts relative to said shaft, disposed in contact with said suction chamber located on said first side.

4,963,075

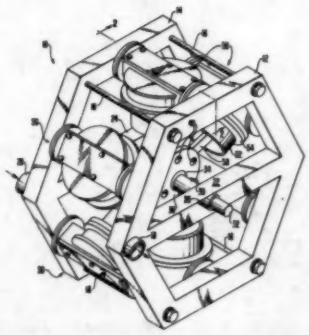
RADIAL DIAPHRAGM PUMP

Philip E. Albertson, and Arthur D. Deken, both of Perry, Okla., assignors to The Charles Machine Works, Inc., Perry, Okla.

Filed Aug. 4, 1988, Ser. No. 228,118

Int. Cl.[5] F04B *43/06, 1/06*

U.S. Cl. 417—273 **14 Claims**



1. A radial diaphragm pump assembly for pumping heavy, slurry-type mixtures, said pump assembly comprising:

a pair of annular hollow manifolds connected in spaced relation, said manifolds forming a pump assembly frame for supporting a plurality of pump units, one of said manifolds providing an inlet for the pump assembly, the other of said manifolds providing an outlet for the pump assembly;

a drive shaft rotatably mounted on said manifolds for providing rotational driving input to the pump assembly, said drive shaft extending axially through said annular manifolds, said drive shaft having an eccentric segment thereon;

an eccentric sleeve rotatably surrounding said eccentric segment, the relative position of said eccentric sleeve with

respect to said eccentric segment on said said valve body being engaged with said opposed support bearings on said opposed faces of said manifolds to support each of said pump units on and between said manifolds,

whereby rotation of said drive shaft imparts orbital motion to said bearing hub through said eccentric segment and said eccentric sleeve thereby reciprocating said piston rods and said pistons so that said pump units pump fluid through the pump assembly and whereby the stroke of said pistons is varied depending on the drive shaft eccentricity determined by the relative position of said eccentric segment and said eccentric sleeve.

4,963,076

RADIAL BLOWER WITH RESILIENTLY MOUNTED BEARING HOLDERS

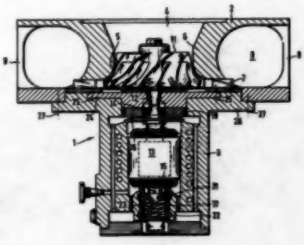
Frank Fleischmann, Bergheim-Glessen; Hans-Peter Kabelitz, and Winfried Kaiser, both of Cologne, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Apr. 3, 1989, Ser. No. 332,867

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1988, 3814130

Int. Cl.[5] F04D 29/04

U.S. Cl. 417—423.7 **4 Claims**



1. Radial blower (1) with a motor housing (3) and a rotating unit, consisting of a shaft (12), a blower rotor (11) and a motor armature (13), mounted in this housing, a first rolling bearing (14) being provided between the blower rotor (11) and motor armature (13), and a second rolling bearing (15) being provided at the end of the shaft remote from the blower rotor and resiliently mounted bearing holders (16, 17) being associated with the respective rolling bearings (14, 15) in the bearing housing (3), characterized in that the outside diameter of the bearing holder (16) of the first bearing (14) is greater than the outside diameters of motor armature (13) and bearing holder (17) of the second bearing (15), and that the diameter of the bearing holder (17) of the second bearing (15) is smaller than or equal to the diameter of the motor armature (13).

4,963,077

PROFILED PLUNGER FOR A RECIPROCATING PUMP

Dragan Besic, West Caldwell, and Wilbur C. Smith, North Caldwell, both of N.J., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 7, 1989, Ser. No. 307,348

Int. Cl.[5] F04B 71/00

U.S. Cl. 417—437 **7 Claims**

1. A reciprocating pump, said pump comprising:

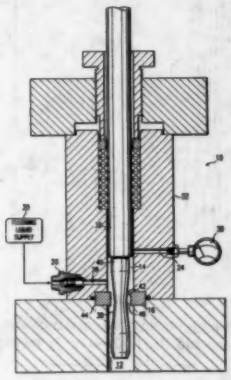
a first housing section, said first section having a main pumping chamber defined therein, said main pumping chamber having an internal perimeter dimension;

a second housing section, said second section having a flushing chamber defined therein, said flushing chamber having an internal perimeter dimension;

a means for connecting said first housing section and said second housing section, said means for connecting having an aperture formed therethrough, said aperture having a perimeter dimension less than said internal perimeter dimension of said flushing chamber, said aperture fluidly connecting said main pumping chamber and said flushing chamber;

a means for supplying flushing fluid to said flushing chamber;

a plunger mounted for reciprocating movement through said



main pumping chamber, said aperture through said means for connecting, and said flushing chamber, said means for connecting and said plunger defining a flushing space therebetween, said plunger having a varying perimeter dimension along its length whereby the dimensions of said flushing space defined between said connecting means and said plunger vary as said plunger reciprocates through said means for connecting; and

means for reciprocating said plunger.

4,963,078

STRESS AND TORQUE REDUCING TOOL AND METHOD

John O. Agee, P.O. Box 507, Big Lake, Tex. 76932

Filed May 26, 1988, Ser. No. 199,172

Int. Cl.[5] F04B 21/04

U.S. Cl. 417—545 **11 Claims**

1. Apparatus for coupling a sucker rod string to a subsurface reciprocating pump in a well bore for production of fluid comprising;

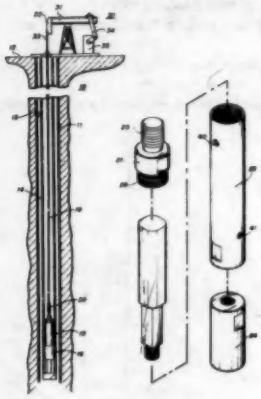
a hollow body means having fluid ports in the upper and lower portions thereof;

an aperture means within the lower portion of said hollow body means;

a plunger means positioned within said hollow body means having a shank extending through said aperture means, said plunger means adapted for limited reciprocating relative movement within said hollow body means;

means for attaching the upper portion of said hollow body means to the bottom of the sucker rod string and means for attaching the plunger means to the subsurface reciprocating pump such that the stress forces encountered in the operation of the subsurface reciprocating pump are dissipated by the apparatus through said limited reciprocating

relative movement of the plunger means within said hollow body means;



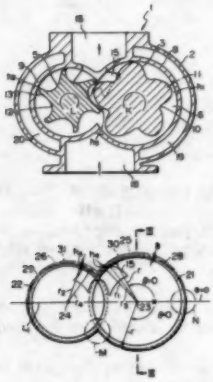
means for limiting relative rotational movement between the plunger means and the hollow body means.

4,963,079

SCREW FLUID MACHINE WITH HIGH EFFICIENCY BORE SHAPE

Mitsuru Fujiwara, Ibaraki; Akira Suzuki, Atsugi, and Riichi Uchida, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 23, 1987, Ser. No. 111,614
Claims priority, application Japan, Oct. 24, 1986, 61-253246
Int. Cl.[5] F01C *1/16, 19/00, 21/10*; F04C *18/16*
U.S. Cl. 418—83 **5 Claims**



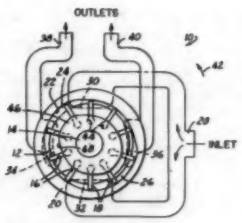
1. A screw fluid machine comprising male and female rotors adapted to rotate about two parallel axes while engaging with each other, and a casing having a pair of bore walls with a low-pressure port and a high-pressure port, said bore walls intersecting with each other and respectively accommodating said male and female rotors, wherein, at a normal temperature, in a plane perpendicular to the axes of said male and female rotors, a distance between a point on an inner surface of at least one of said bore walls and a corresponding one of said axes of said male and female rotors decreases corresponding to a bore surface displacement in a radial direction under operating conditions as the point is traced along the inner surface in a circumferential direction of said bore walls in a region where said at least one of said bore walls faces grooves of said one corresponding rotor under high pressure, and a shape of said at least one of said bore walls during operating conditions becomes a more exact circle in a plane perpendicular to the rotor axis.

4,963,080

ROTARY HYDRAULIC VANE MACHINE WITH CAM-URGED FLUID-BIASED VANES

Lowell D. Hansen, Jackson, Miss., assignor to Vickers, Incorporated, Troy, Mich.

Filed Feb. 24, 1989, Ser. No. 314,884
Int. Cl.[5] F04C *15/00*
U.S. Cl. 418—260 **5 Claims**



1. A rotary hydraulic machine that comprises:

a housing,

a rotor mounted for rotation within said housing, said rotor having a plurality of radially extending peripheral slots and a fluid pressure chamber at a radially inner edge of said slot,

a plurality of vanes individually slidably mounted in said slots,

means forming a cam ring within said housing surrounding said rotor and having a radially inwardly directed surface forming a vane track and at least one fluid pressure cavity between said surface and said rotor,

fluid inlet and outlet means in said housing coupled to said at least one cavity,

cam means mounted within said housing in fixed position within said cam ring, said cam means having radially outwardly oriented cam surface means of continuous contour substantially identical to contour of said cam ring surface, said cam surface means being position to engage said vanes so as to position radially outer edges of said vanes adjacent to but spaced from said cam ring surface, and

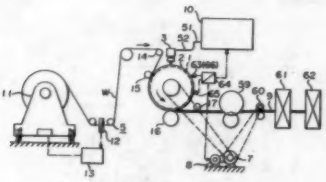
means in said housing for feeding fluid under pressure to said rotor chambers so as to lift said vanes from said cam surface means and urge said vanes against said cam ring surface, such that said vanes are normally urged against said cam ring surface and spaced from said cam surface means by fluid pressure in said chambers while said cam surface means limits radially inward motion of said vanes in the event of fluctuation or loss of fluid pressure in said chambers.

4,963,081

SEPARATOR MANUFACTURING APPARATUS

Hisao Yokoya, Nakatsugawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 251,365, Sep. 30, 1988, Pat. No. 4,897,026.
This application Nov. 1, 1989, Ser. No. 430,507
Claims priority, application Japan, Oct. 1, 1987, 62-248414; Oct. 1, 1987, 62-248413; Oct. 26, 1987, 62-269775; Oct. 26, 1987, 62-269774; Oct. 26, 1987, 62-269773
Int. Cl.[5] B29C *33/72*
U.S. Cl. 425—115 8 Claims



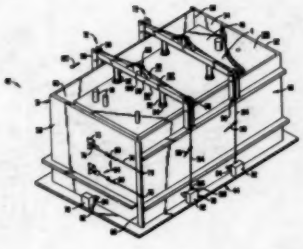
1. A separator manufacturing apparatus which comprises:
- a transfer roller with a plurality of annular shaping grooves having a predetermined shape in cross section which are formed in the outer circumferential surface of said roller in its circumferential direction,
- a resin feeding device with a nozzle means to feed a hot-melt type resin having high adhesion properties to said annular shaping grooves of the transfer roller,
- a base paper feeding device to feed a continuous paper at a predetermined speed to a part of said outer circumferential surface of the transfer roller supplied with said resin to thereby form by transfer a plurality of ribs having a predetermined shape corresponding to the annular shaping grooves on a surface of said continuous paper, and
- a shaping groove cleaning device positioned to remove resin remaining in said shaping grooves after forming said ribs on said paper and prior to feeding resin additional resin to said shaping grooves.

4,963,082

APPARATUS FOR ENTOMBMENT OF TANKS IN CONCRETE

Thomas R. Lindquist, Denair, and Ralph Bambacigno, Modesto, both of Calif., assignors to Convault, Inc., Denair, Calif.

Division of Ser. No. 118,919, Nov. 16, 1987, Pat. No. 4,826,644, which is a continuation-in-part of Ser. No. 936,205, Dec. 1, 1986.
This application Mar. 9, 1989, Ser. No. 298,548
Int. Cl.[5] B28B *23/00*
U.S. Cl. 425—117 2 Claims



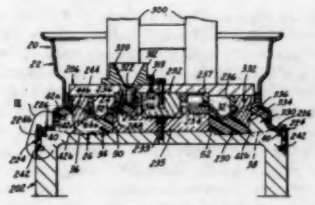
1. Apparatus for encasing a rigid hollow tank having at least one access tube in a homogeneous layer of concrete when the tank has buoyancy with respect to fluid concrete comprising:
- a base plate;
- wall forms combinable to create a circumferential sidewall form;
- means for securing the wall forms to one another;
- means for laterally positioning the sidewall forms on the base plate, the sidewall form and base plate defining an enclosure;
- a hold-down member having a tank engaging element, wherein the hold-down member includes an elongate bar with a strong-back reinforcing member on an upper surface of the bar, the bar having ends at opposite sides of the sidewall form, the strongback strengthening the bar against upward bending caused by any buoyant force of the tank while the concrete is fluid;
- means for mounting the hold-down member over the enclosure, the tank engaging element adapted to engage said rigid hollow tank within the enclosure;
- means, coupled to the base plate, for forcing the hold-down member against the rigid hollow tank to counteract said buoyancy of the tank caused when concrete is poured into a portion of the enclosure surrounding the tank, wherein the forcing means includes chain means having a first end connected to the base plate at a first point, a length passing over the bar and over the strongback and a second end connected to the base plate at a second point; and
- wherein the concrete completely surrounds and encases the rigid hollow tank leaving no portion of the tank exposed and only said access tube protruding from the concrete.

4,963,083

COMPOSITE METAL-ELASTOMER STYLED WHEELS AND METHOD AND APPARATUS FOR MOLDING THE SAME

Robert J. Stalter, Sr., Bowling Green, and Albert H. Prueter, Perrysburg, both of Ohio, assignors to Motor Wheel Corporation, Lansing, Mich.

Filed Dec. 16, 1988, Ser. No. 285,634
Int. Cl.[5] B22C *9/28*
U.S. Cl. 425—125 26 Claims



1. Apparatus for static molding of a composite styled wheel comprising a middle mold part comprising of a metal disc and rim subassembly operable as metal street wheel when a pneumatic tire is mounted on said rim, said disc having a circular row of air venting openings therethrough, a base mold part having an annular lip in sealing engagement against an annular portion of said metal wheel radially outwardly of the center of the disc in the closed condition of said mold apparatus, said base mold part having a mold cavity surface to provide an ornamental configuration for the outboard face of a plastic body of the composite wheel, said mold cavity surface in said closed condition defining with at least part of the outboard face of said middle mold part a mold cavity axially adjacent the outboard face of said middle mold part in which said plastic body is formed by injection and curing of a liquid reaction mixture in said mold cavity, and a clamp seating in said closed condition against the inboard face of said middle mold part urging said middle part into said sealing engagement with said base mold part, said mold parts being axially separable from one another to open said mold apparatus and to clear said

middle mold part from said clamp and base mold parts, the improvement wherein said clamp includes inboard pocket core means disposed in individual registry with said disc vent openings so as to protrude therethrough into said mold cavity in the closed condition of said mold, and said base mold part includes outboard pocket core means in juxtaposed radially outwardly offset and axially overlapping relation to said inboard pocket core means in said closed condition, said outboard pocket core means terminating short of an axially juxtaposed associated portion of said outboard face of said disc and rim subassembly so as to be spaced axially, outboard therefrom in the closed condition of said mold, said inboard and outboard core means cooperating to define a circular row of radially staggered interengaged pairs of air passageways cores in said mold cavity.

4,963,084

GRANULATING APPARATUS

Reinhard Froeschke, Weinstadt, Fed. Rep. of Germany, assignor to Santrade Ltd., Luzern, Switzerland

Continuation of Ser. No. 155,716, Jan. 11, 1988, abandoned. This application Mar. 6, 1990, Ser. No. 489,873

Claims priority, application Fed. Rep. of Germany, May 9, 1986, 3615677

Int. Cl.[5] B30B *11/20*; B01J *2/12*

U.S. Cl. 425—331 **15 Claims**

1. Granulating apparatus for the granulation of low viscosity material comprising a perforated hollow rotary roll and a contact pressure rotary roll eccentrically located inside the hollow roll and abutting against an inner wall of the hollow roll, the hollow roll and the contact pressure roll being rotatable about first and second parallel horizontal axes lying in a substantially vertical plane common to both axes, both the inner wall of the hollow roll and an outer wall of the contact pressure roll provided with axially extending, mutually corresponding toothed ledges which intermesh to press the material through holes formed in the hollow roll between two adjacent toothed ledges thereof, the hollow roll being supported for rotation about said first axis and provided over its entire circumference with said holes, the contact pressure roll being located in the lowermost zone of the hollow roll in such manner that the toothed ledges intermesh in the lowermost zone to define therebetween a nip zone tapering in a common direction of rotation of the rolls, first heating means carried by the contact pressure roll and arranged to heat a lower portion of the contact pressure roll disposed in the lowermost zone to maintain material in the nip zone at low viscosity, a second heating means for heating said hollow roll for maintaining material in said holes at low viscosity, said feeder device including outlet opening means arranged in an area of the nip zone between the hollow roll and the contact pressure roll for discharging material into the nip zone, the pressure roll contacting two ledges of the hollow roll as a hole disposed between such two contacted ledges reaches the lowermost zone so that a suction created at such hole after the hole passes the lowermost zone is sufficient to prevent material from flowing out of the hole, and a conveyor belt arranged to move transversely of the axes beneath the hollow roll such that material extruded through the holes falls in drop form onto the conveyor belt and solidifies thereon.

4,963,085

CELL FILM BREAKING APPARATUS FOR FOAMED PRODUCTS

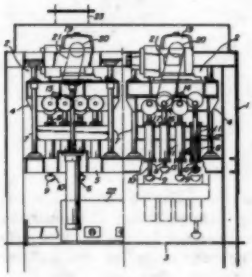
Ryuji Kishii, Yokohama, and Akinori Takemiya, Chigasaki, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Feb. 21, 1990, Ser. No. 482,477

Claims priority, application Japan, Feb. 21, 1989, 1-39257

Int. Cl.[5] B29C *59/02*

U.S. Cl. 425—385 **9 Claims**



1. A cell film breakinq apparatus for foamed products comprising transfer means for transferring the foamed products through the apparatus, an apparatus frame arranged above the transfer means to be raised and lowered relative to the transfer means by means of reciprocating means, a plurality of pressing means mounted on the apparatus frame to be urged upward relative thereto, cam means driving the pressing means downward, respectively, and rotating driving means for rotating the cam means in synchronism with each other.

4,963,086

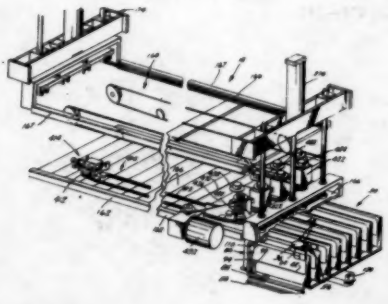
REHEAT BLOW MOLDING MACHINE FOR FORMING ARTICLES FROM PREFORMS

James G. Wiatt, Cincinnati, Ohio; Kevin J. Swiderski, Lowell, Mich.; Samuel L. Belcher, and Roger D. Smith, both of Cincinnati, Ohio, assignors to B & G Machinery, Grand Rapids, Mich.

Filed May 15, 1989, Ser. No. 352,846

Int. Cl.[5] B29C *49/64*

U.S. Cl. 425—526 **24 Claims**



1. A reheat blow mold machine, comprising:

an oven for heating premanufactured preforms to a blow temperature, said oven including an elongated base;

a plurality of pallet assemblies slidably supported on said base in tandem, abutting relationships, said base having a discharge end and a loading end and each pallet assembly having means for holding a plurality of preforms;

a return conveyor;

a discharge elevator for transferring a pallet from the discharge end of said base to the return conveyor and a load elevator for transferring a pallet from the return conveyor to a load position at the load end of said base;

a preform loader means at said oven for receiving preforms and moving them to said load position for engagement by the pallets;

a blow mold station means adjacent a discharge end of said oven for blow molding heated preforms into articles; and

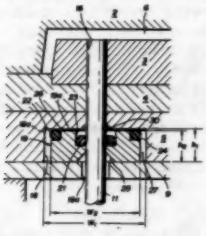
preform transfer means for transferring preforms from said oven to said mold station and for ejecting said articles from said mold station means.

4,963,087

EXPANSION INJECTION MOLDING DIE

Hiroshi Aida; Shoichi Hamada, both of Kawasaki, and Hisanori Kato, Tokyo, all of Japan, assignors to Nippon Steel Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1989, Ser. No. 344,131
Claims priority, application Japan, Apr. 28, 1988, 63-104192
Int. Cl.[5] B29C *45/40*
U.S. Cl. 425—556 **7 Claims**



1. An expansion injection molding die comprising:

a cavity plate;

a core plate for forming a die cavity between the core plate and the cavity plate;

a backup plate for supporting the core plate;

holes formed through the backup plate and the core plate the holes extending to the die cavity;

ejector pins held on an ejector plate, the ejector pins being adapted to be inserted into the holes to separate molded products from the die cavity;

a gas introducing passage communicating with a pressurized gas source to introduce a gas under pressure into the die cavity;

hollow portions formed in at least one of said backup plate and said core plate, the hollow portions having cross sections larger than the holes formed through the backup plate and the core plate;

guide rings each having an ejector pin insertion hole and a seal accommodating portion, the seal accommodating portion being set larger in diameter than the ejector pin insertion hole, the guide rings being installed int he respective hollow portions in such a way that they are movable int he hollow portions at least two-dimensionally; and

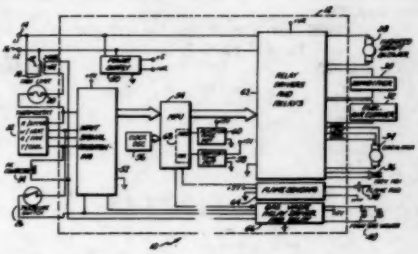
a first sealing member installed in the sal accommodating portion, the first sealing member being in sliding contact with an ejector pin where an associated ejector pin passes through an ejector pin insertion hole of a guide ring.

4,963,088

SAFETY-RELATED PARAMETER INPUTS FOR MICROPROCESSOR IGNITION CONTROLLER

John L. Erdman, Eden Prairie, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 1, 1988, Ser. No. 239,453
Int. Cl.[5] F23N *5/00*
U.S. Cl. 431—2 **13 Claims**



4. In a digital control system for controlling an apparatus based upon present safety-related input parameter, an improvement comprising:

means for providing, as the preset safety-related input parameter, first and second individually variable analog signals;

means for converting the first and second analog signals to first and second digital signals, respectively;

means for controlling the apparatus based upon at least one of the first and second digital signals;

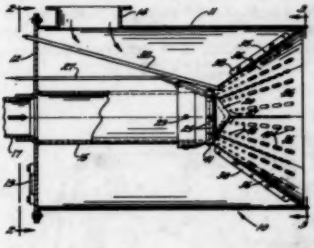
means for inhibiting operation of the apparatus unless the first and second digital values have a predetermined complementary relationship.

4,963,089

HIGH TURNDOWN BURNER WITH INTEGRAL PILOT

Lyle S. Spielman, Rockford, Ill., assignor to Eclipse, Inc., Rockford, Ill.

Filed Aug. 24, 1989, Ser. No. 397,917
Int. Cl.[5] F23D *15/02*
U.S. Cl. 431—351 **10 Claims**



1. A gas burner comprising a burner body having a mixing and combustion zone, means for admitting combustion air into said mixing and combustion zone, a fuel conduit for gaseous fuel, a fuel manifold communicating with said conduit and having a wall with a series of angularly spaced main fuel ports formed therethrough for discharging said fuel from said conduit and into said mixing and combustion zone for mixture with said combustion air, a single pilot gas port formed through said wall of said manifold, a pilot gas conduit communicating with said pilot gas port and operable to supply a flow of pilot gas through said manifold ny way of said pilot gas port, said pilot gas conduit and said pilot gas port being isolated from said fuel

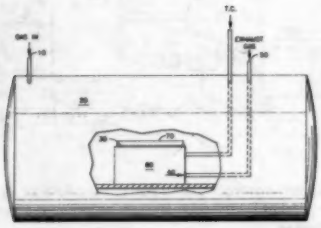
conduit, from said series of main fuel ports and from said combustion air admitting means, and means for igniting the gas discharged from said pilot gas port.

4,963,090

REVERSE FLOW FURNACE/RETORT SYSTEM

Clare M. Allocca, Lake Park, and Thomas L. Camella, Jupiter, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 3, 1989, Ser. No. 431,414
Int. Cl.[5] F27D *7/02, 7/06*
U.S. Cl. 432—23 **6 Claims**



1. A method for preventing contamination of a furnace, said method using a gas tight furnace and a retort, which comprises:

a. placing the retort in the furnace;

b. using a porous seal to create a controlled leakage path between the furnace and retort;

c. creating a pressure gradient between the retort and the furnace; and

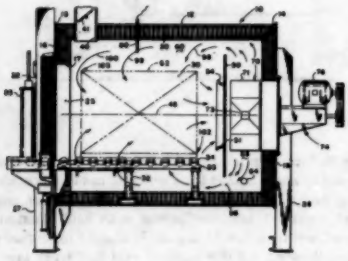
d. removing the exhaust gas from the retort; whereby a pressure gradient is created across the porous seal such that the pressure within the retort is greater than the pressure on the other side of the porous seal, wherein the pressure gradient causes the gas to flow into the retort.

4,963,091

METHOD AND APPARATUS FOR EFFECTING CONVECTIVE HEAT TRANSFER IN A CYLINDRICAL, INDUSTRIAL HEAT TREAT FURNACE

Max Hoetzl; James A. Brandewie, both of Toledo, Ohio, and Thomas M. Lingle, Temperance, Mich., assignors to Surface Combustion, Inc., Maumee, Ohio

Filed Oct. 23, 1989, Ser. No. 425,686
Int. Cl.[5] F27D *11/02*
U.S. Cl. 432—176 **11 Claims**



1. An industrial heat treat furnace for thermally treating loose work pieces placed in baskets comprising:

(a) a cylindrical casing with blanket insulation secured thereto defining an open smooth cylindrical furnace enclosure closed at one axial end by a furnace wall and having a sealable door to close the opposite axial end;

(b) an annular fan face plate concentrically positioned within said casing and defining a cylindrical pressure zone axially extending between said fan plate and said closed end and a cylindrical work zone axially extending between said fan plate and said door end where work to be heat treated is positioned;

(c) fan means within said pressure zone for developing within said pressure zone a wind mass pressurized against and swirling about said insulation in an essentially non-turbulent manner said fan means including a paddle wheel fan having paddle wheel impellers extending radially outward from said fan's rotating shaft to direct said wind mass against said insulation as a swirling mass which initially tends to be stationary without an axial force component;

(d) said fan face plate having an outside diameter which is smaller by a predetermined distance than the inside diameter of said insulation to define a non-orificing annular space, said fan means in combination with said non-orificing annular space and smooth cylindrical casing effective to cause said wind mass to continuously exit said pressure zone through said non-orificing annular space in the form of an annular wind mass and axially travel at a low speed relative to its circumferential speed, in said work zone, towards said door while said wind mass swirls about said insulation in a non-turbulent manner at the interface of said insulation with said wind mass;

(e) means situated within said furnace enclosure to change the temperature of said wind relative to the work; and

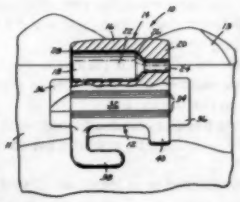
(f) said fan face plate having a generally central opening therein, said fan means in combination with said central opening forming under pressure zone means, said under pressure zone means effective to cause inner diameter portions of said annular swirling wind mass to impinge said work along the entire length and width of said work prior to the spend wind mass returning to said pressure zone through said central opening for achieving substantially uniform convective heat transfer with said work.

4,963,092

BUCCAL TUBE APPLICANCE FOR RECTANGULAR OR ROUND WIRE

Wilford A. Snead, San Dimas, Calif., assignor to Unitek Corporation, Monrovia, Calif.

Filed Apr. 28, 1989, Ser. No. 344,893
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—17 **6 Claims**



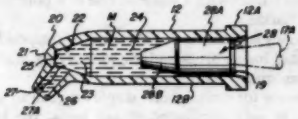
1. A buccal tube appliance having a base and a tube connected to said base, said tube extending in a generally mesiodistal direction and having an open-ended mesial end portion and a distal end portion integrally connected to said mesial end portion, said distal end portion being immovable relative to said mesial end portion and having a rectangular passage for receiving a rectangular wire, said mesial end portion having a passage leading from said rectangular passage and adapted to receive a round wire having a cross-section larger than said rectangular passage.

4,963,093

DENTAL SYRINGE TIP AND SYRINGE HOLDER THEREFOR

William B. Dragan, 85 Burr St., Easton, Conn. 06612

Filed Feb. 6, 1989, Ser. No. 306,471
Int. Cl.[5] A61C *5/04*
U.S. Cl. 433—90 **11 Claims**



1. A syringe tip for use in a dental syringe for the placement of a predetermined amount of a viscous dental composite resin filling material in a tooth to form a tooth restoration comprising

a body portion having a generally cylindrical shape to define a reservoir portion for containing a predetermined amount of dental filling material.

said body portion having an opening co-extensive to the cylindrical shape of said reservoir portion at one end thereof,

a laterally extending flange circumscribing said opening,

and said body portion having a tapering closed end at the other end thereof disposed in axial alignment with the axis of said body portion,

said tapering closed end having an internal conically shaped wall surface tapering toward said closed end terminating in a blunt internal end wall,

said internal conically shaped wall surface defining an internal frustro conical chamber being disposed in open communication with and forming a continuation of said reservoir portion,

and a discharge nozzle angularly disposed relative to said closed end,

said discharge nozzle including a passageway through which the material contained in said internal frustro conical chamber and reservoir portion is adapted to be extruded,

and a displaceable piston for sealing the open end of said reservoir portion; said displaceable piston having a conical front end complementing said internal conically shaped wall surface.

4,963,094

VACUUM CONTROLLER AND FILTER ASSEMBLY FOR DENTAL VACUUM SYSTEM

Robert A. Meyer, Spearfish, S. Dak., assignor to Ramvac Corp., Spearfish, S. Dak.

Continuation of Ser. No. 37,790, Apr. 13, 1987, abandoned. This application Apr. 28, 1989, Ser. No. 344,459
Int. Cl.[5] A61M *31/00*
U.S. Cl. 433—95 **28 Claims**

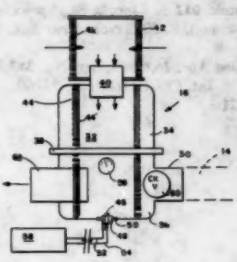
21. A multi-function control component for use in dental vacuum system which includes a plurality of dental operatories connected to a separating tank, a vacuum pump and a motor for driving said pump, said control component comprising:

(a) a housing located remote from said separating tank and provided with an inlet end adapted to be connected to a vacuum line from the separating tank, and an outlet end adapted to be connected to a vacuum line to the vacuum pump such that gas flow from the separating tank flows through said housing;

(b) first valve means in said inlet end of said housing responsive to vacuum intensity;

(c) second valve means mounted in a wall of said housing adapted to open to permit entry of bypass air in response to a vacuum level exceeding a predetermined maximum;

(d) means in said housing for indicating moisture in said housing; and



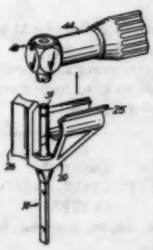
(e) first filter means adapted to filter flow between said inlet end and said outlet end.

4,963,095

DENTAL PACKING INSTRUMENTS

Bernard Weissman, 225 E. 48th St., New York, N.Y. 10017

Filed Feb. 17, 1989, Ser. No. 312,547
Int. Cl.[5] A61C *1/07*
U.S. Cl. 433—118 **5 Claims**



1. For use in a dental device comprising reciprocating drive means, the reciprocating drive means comprising a reciprocating member for providing reciprocating motion and designed to retain a dental tool, the dental tool comprising:

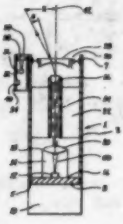
frame means for securing the dental tool to the reciprocating drive means; a hammer member designed to be retained by said reciprocating member, and comprising a drive shank portion, a hammer shank portion formed integral with and extending axially from one end of the drive shank portion and a hammer head secured to the distal end of the hammer shank, and having a hammer end surface; and a hammer barrel, forming a sheath for the hammer member and coaxial therewith, the hammer barrel being rotatably secured to the frame means and being open at an end substantially surrounding the hammer head, the hammer head having a length relative to the hammer barrel such that at one extreme of its reciprocating movement, the end of the hammer is substantially coextensive with the end of the hammer barrel, and at the other extreme of its reciprocating movement, is further within the barrel, the hammer being designed to pack dental thread around the margin of a prepared tooth preparatory to making a dental impression, when the hammer is driven by the reciprocating member.

4,963,096

DEVICE AND METHOD FOR IMPROVING SHOOTING SKILLS

Anwar S. Khattak, 612 S. Lincoln St., Spokane, Wash. 99204, and Masao Shimoji, E. 3012 Nora Rear Apt., Spokane, Wash. 99207

Filed Apr. 26, 1989, Ser. No. 343,199
Int. Cl.[5] F41G *3/00, 11/00*
U.S. Cl. 434—21 **12 Claims**



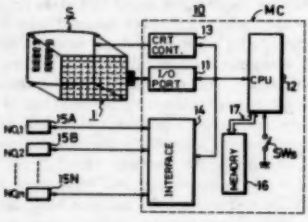
1. A device for improving shooting skills, comprising:
- a housing means for enclosing said device, said housing means has a base means;
- a power source means operably connected to said housing means for supplying power to said device;
- a means mounted on said base means for emitting at least one of a laser beam and a light beam;
- a first lens means mounted on said base means for passing and reflecting at least one of said laser beam and said light beam;
- a second lens means for deflecting at least one of said laser beam and said light beam; and
- a motor means for mounting and continuously rotating said second lens means so as to form a reflecting target image to be aimed at by a shooter.

4,963,097

DISPLAY APPARATUS FOR A GROUP EDUCATION SYSTEM

Shinji Aoju, Saitama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 631,810, Jul. 17, 1984, abandoned. This application Apr. 27, 1986, Ser. No. 869,449
Claims priority, application Japan, Jul. 25, 1983, 58-136549
Int. Cl.[5] G09B *29/00*; G09G *3/02*
U.S. Cl. 434—431 **16 Claims**



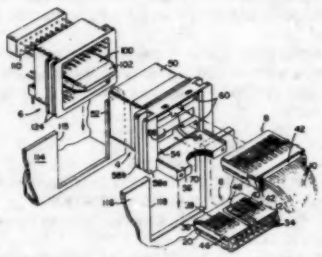
1. A display apparatus for a group education system having a plurality of physically ordered seat positions assignable for student use, comprising:
- a display screen having a portion divided into a plurality of designatable image areas;
- selection means for selecting said designatable image areas one at a time and displaying a visually identifiable indicator in said selected one of said designatable image areas;
- means for designating said one selected image area as an image area assigned for student use to correspond to one of said seat positions, said designated image area having a position on said display screen in accordance with the physical ordering of said one of said seat positions;
- means for identifying each said designated image area by associating therewith a selected one of a plurality of identifying marks;
- storage means for storing position data corresponding to the designated image areas and the identifying marks respectively associated therewith;
- control means for causing said display screen to selectively display, in said designated image areas, the identifying marks associated therewith in response to the stored position data; and
- a unitary control member actuable for reassigning said stored position data corresponding to said designated image areas and the identifying marks associated therewith to respective ones of said image area as new designated image areas having respective positions on said display screen in accordance with a physical reordering of said seat positions so that said control means causes said display screen to selectively display the identifying marks in the new designated image areas associated therewith in response to the reassigned stored position data without reentry of position data in said storage means.

4,963,098

BLIND MATE SHIELDED INPUT/OUTPUT CONNECTOR ASSEMBLY

John M. Myer, Millersville; Richard W. Grzybowski, Lebanon, both of Pa., and Thomas J. Kane, Dearborn, Mich., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 317,037, Mar. 1, 1989, abandoned, which is a continuation of Ser. No. 161,067, Feb. 26, 1988, abandoned. This application Aug. 24, 1989, Ser. No. 397,350
Int. Cl.[5] H01R *13/629, 13/514*
U.S. Cl. 439—76 **29 Claims**



1. An input/output electrical connector assembly for use in mounting an electrical component on a workpiece and interconnecting the electrical component to an electrical conductor harness having one or more multiconductor electrical connectors, each having a plurality of terminals attached to electrical conductors in the harness, the assembly comprising:
- a header including a plurality of electrically conductive pins and an insulative body, rear ends of the pins being insertable into apertures in a panel, the pins being mounted in the body in an ordered array corresponding to the orientation of the terminals in the one or more electrical connectors, the header including at least one alignment post protruding from the body beyond the pins, the header further including means for attachment to the electrical component; and

a receptacle module having front and rear faces with one or more connector mounting cavities extending between the front and rear faces, each connector mounting cavity receiving one of the electrical connectors upon insertion thereof through the rear face, and means on the receptacle module for mounting the receptacle module on the workpiece, the receptacle module having at least one alignment cavity extending inwardly from the front face for receiving each said alignment post upon insertion through the front face, whereby the electrical component can be connected to the conductors in the harness by mating the header to the receptacle module.

4,963,099

ELECTRICAL JUNCTION BOX

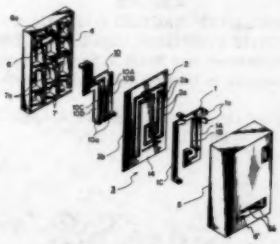
Hisashi Sato; Yukio Nishio; Hideharu Hayashi; Masaki Yamamoto, and Toru Takahashi, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Mar. 24, 1989, Ser. No. 328,419

Claims priority, application Japan, Mar. 25, 1988, 63-38430[U]; Apr. 5, 1988, 63-45235[U]

Int. Cl.[5] H01R *9/09, 4/60*

U.S. Cl. 439—76 **4 Claims**



1. An electrical junction box comprising: a case having a rib; a wiring board assembly provided in said case and having an insulating board with a plurality of bus bars mounted on said insulating board and adjacent to one another, said bus bars being sandwiched between said insulating board and said rib of said case; and a drainage space provided in facing relation to at least one of said bus bars.

4,963,100

ELECTRIFIED VACUUM CLEANER HOSE ADAPTER

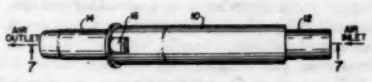
Joseph Genoa, Freeport; Harold Kaskel, Long Beach, both of N.Y., and Carl Nelson, Wyckoff, N.J., assignors to Atlantic Vacuum Parts Corp., Long Beach, N.Y.

Continuation of Ser. No. 28,714, Mar. 20, 1987, Pat. No. 4,804,333, which is a continuation of Ser. No. 675,949, Nov. 28, 1984, Pat. No. 4,652,063. This application Feb. 10, 1989, Ser. No. 309,615

The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.

Int. Cl.[5] H01R *4/64*

U.S. Cl. 439—191 **16 Claims**



1. An electrified vacuum cleaner hose adapter for interconnecting an electrified vacuum cleaner hose with an electrified wand or accessory, comprising:

a generally tubular main handle member (10) comprising a first generally tubular portion integral with a second generally tubular portion, said first and second tubular portions having respective longitudinal axes which are at an angle with each other;

a tubular inlet member (12) at one end portion of said first tubular portion and which is receivable in an opening of an electrified vacuum cleaner hose;

a tubular outlet member (14) at one end portion of said second tubular portion and which is receivable in an opening of an electrified vacuum cleaner wand or accessory;

first electrical connector means (24) connected to the one end portion of said first tubular portion adjacent said inlet member (12) and having electrical contacts for matingly and electrically connecting with an electrical connector of said electrified vacuum cleaner hose;

second electrical connector means (22) connected to the one end portion of said second tubular portion adjacent said outlet member (14) and having electrical contacts for matingly and electrically connecting with an electrical connector of said electrified wand or accessory;

a pair of electrical conductors extending between and electrically connecting said first and second electrical connector means;

an elongated projecting member (20) fixedly coupled to said main handle member and having a protruding portion protruding from a lower side of said main handle member over at least a substantial portion of the length of said main handle member and extending between said first and second electrical connector means and defining a covered passage between said first and second electrical connector means, said electrical conductors extending within said covered passage so as not to be exposed to the outside of said covered passage, said protruding portion of said projecting member (20) at least partly defining said covered passage and also defining a manually grippable, slip resistant portion (50) over a predetermined portion of the length of said protruding portion, said slip resistant portion (50) extending substantially along said first tubular portion for engagement with a user's hand when a user's hand is gripped around said first tubular portion of said adapter;

said projecting member (20) having connector receiving and engaging means at each opposite end thereof, for receiving and engaging said first and second electrical connector means, respectively, and in cooperation with said main handle member, for fixedly maintaining said first and second electrical connector means in a fixed position; and

at least one elongated connecting means (26,28) passing at least through said projecting member, and at least partially through said main handle member to fix said projecting member relative to said main handle member and to secure said electrical connector means in a fixed position;

said elongated projecting member (20) being thereby fixedly coupled to said main handle member such that it is immovable relative to said main handle to positively prevent said elongated projecting member (20) and said electrical connector means from moving circumferentially around said main handle member during use, thereby maintaining structural integrity, grippability and safety during use.

4,963,101

ELECTRICAL PIN WITH BEND

Noel Lee, 47 West Park Drive, Daly City, Calif. 94015

Continuation of Ser. No. 259,845, Oct. 19, 1988, Pat. No. 4,834,666, which is a continuation of Ser. No. 832,486, Mar. 30, 1987, abandoned. This application Feb. 23, 1989, Ser. No. 314,440

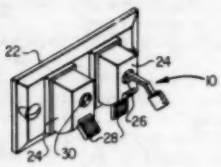
Int. Cl.[5] H01R *13/44*

U.S. Cl. 439—266 **3 Claims**

1. An assembly for electrically and mechanically connecting an electrical conductor to an electronic component, said assembly comprising:

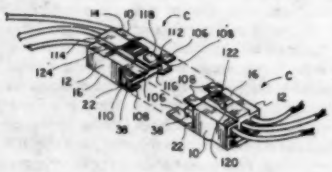
terminal means connected to said component and comprising:

a housing defining an opening,
a plate,
means engaging said plate for normally urging said plate to a position wherein it extends across said opening, and
manually actuatable means for urging said plate from said position to expose said opening; and
a connector comprising:
a base member adapted for connection to said conductor,
a first shank portion extending from said base member,
a second shank portion extending from said first shank portion at an angle to said first shank portion,



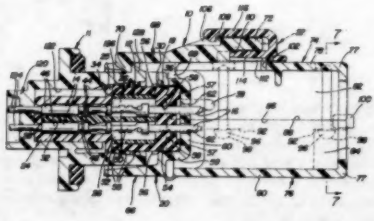
said second shank portion having a square cross section and being sized to extend within said opening in said housing in a substantially horizontal position with said first shank portion and said base member extending downwardly at said angle, said angle being sufficient to reduce the stress on the connection between the base member and the conductor, and
a notch formed around the outer peripheral surface of said second shank portion for receiving said plate to lock said connector relative to said terminal.

4,963,102
ELECTRICAL CONNECTOR OF THE HERMAPHRODITIC TYPE
William A. Gettig, and Larry E. Shook, both of Millheim, Pa., assignors to Gettig Technologies, Spring Mills, Pa.
Filed Jan. 30, 1990, Ser. No. 472,271
Int. Cl.[5] H01R *13/28*
U.S. Cl. 439—291 **10 Claims**



1. A hermaphroditic connector for electrical conductors having a terminal affixed thereto, said terminal including a blade having lateral tangs, a lock lug and an overlying spring arm, comprising;
a connector housing having a front and rear and top, bottom and side walls,
a row of laterally adjacent conductor passageways axially extending from said rear to said front,
a plurality of peripheral walls defining a rear portion of each said passageway,
a transversely disposed shelf extending forwardly of all of said passageway rear portions of said row and having an inner surface substantially axially aligned with said passageway rear portions,
axially extending ridges normal to said shelf inner surface defining therebetween passageway front portions aligned with said rear portions,
axially extending grooves in two of said passageway walls defining each said rear passageway portion adapted to receive said pair of lateral tangs on one said terminal,
an axially extending slot in another one said passageway rear portion wall adapted to receive said terminal lock lug,
deflectable lock means aligned with each said slot intermediate said passageway rear and front portions and adapted to snap-lock with said terminal lug within any one said passageway when said terminal spring arm is disposed within said passageway front portion adjacent said shelf inner surface.
a nose on said shelf defining the forwardmost portion thereof, whereby
said terminal when locked within said housing is positioned with said spring arm masked behind said nose and said blade spaced from said nose to receive therebetween a blade from an opposed inverted similar connector housing and terminal,
alignment means on said top and bottom walls projecting from said housing front, and
lock and catch means on said housing top and bottom walls adapted to engage each other when two opposed inverted said connector housings are joined with said sides walls in juxtaposition.

4,963,103
ELECTRICAL CONNECTOR WITH IMPROVED CONNECTOR POSITION ASSURANCE DEVICE
Randy L. Fink, Warren, and Bruce J. Serbin, Austintown, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 20, 1989, Ser. No. 424,753
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—352 **5 Claims**



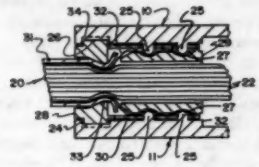
1. In an electrical connector having a pump handle lock arm which is hinged to a connector body of the electrical connector midway between its ends to provide a forward lock arm for locking the electrical connector to a mating electrical connector and a rearward release handle which is depressible to pivot the lock arm out of engagement with a cooperating lock nib of a mating electrical connector, and a connector position assurance device for assuring proper engagement of the lock arm and preventing depression of the release handle, the improvement comprising:
the release handle having an upper surface and a lower surface which faces a generally planar surface of the connector body,
the upper surface having a lock shoulder and the lower surface having a longitudinal groove which extends to a free end of the release handle,
the connector position assurance device including a tongue which is sized to fit in the groove of the release handle when the lock arm is disposed in a properly locked position, and
the connector position assurance device further including a lock arm which cooperates with the lock shoulder of the release handle to lock the connector position assurance device in position.

4,963,104

SHIELDED CONNECTOR ASSEMBLY

Robert G. Dickie, Newmarket, Canada, assignor to Spark Innovations, Inc., Newmarket, Canada

Filed May 1, 1989, Ser. No. 345,787
Int. Cl.[5] H01R *13/648, 13/58*
U.S. Cl. 439—460 11 Claims



1. An electrical connector assembly comprising:

a pair of connector half shells which, when mated together, define therebetween an enclosed space having a front entry and a rear entry,

said front entry being arranged to receive a connector block for providing electrical connections for a plurality of conductors,

said rear entry being arranged to receive a multiconductor cable including an outer jacket, an intermediate conductive shielding layer and an interior plurality of conductors, and

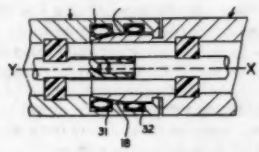
a one piece double bushing arrangement having an external bushing dimensioned to fit on the outside of said outer jacket and an internal bushing coaxial with said external bushing but with a substantially smaller inner diameter and dimensioned to fit over said interior plurality of conductors such that, when said half shells are mated together, said external bushing grasps said outer jacket to provide strain relief and said internal bushing forces said intermediate conductive layer outwardly against said rear entry surface without folding said intermediate conductive layer to provide a continuous electromagnetic shield around said conductors.

4,963,105

ELECTRICAL CONNECTOR ASSEMBLY

Christopher Lewis, Southboro; Donald G. Gartzke, Ipswich, and Anthony R. Scannelli, Stoneham, all of Mass., assignors to Dynawave Incorporated, Georgetown, Mass.

Filed Mar. 3, 1989, Ser. No. 318,864
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—578 19 Claims



1. An electrical connector assembly comprising:

male plug means comprising a male inner conductor, a cylindrical male outer conductor surrounding said male inner conductor and having an annular outer surface portion, and electrical insulation means separating said male inner conductor from said male outer conductor;

female plug means comprising a female inner conductor, a cylindrical female outer conductor surrounding said female inner conductor and having an annular inner surface portion surrounding said annular outer surface portion and electrical insulation means separating said female inner conductor from said female outer conductor; and

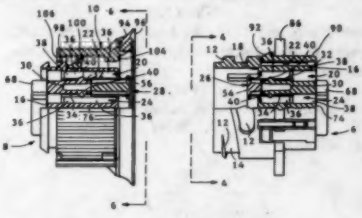
an annular electrically conductive coil spring extending around said outer surface portion and engaged between said inner and outer surface portions, said spring adapted to exert therebetween forces that produce axial loading between said male and female outer conductors.

4,963,106

ELECTRICAL CONNECTOR HOUSING ASSEMBLY

Hannes J. Wendling, Langen, and Harald Bouda, Haibach, both of Fed. Rep. of Germany, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 26, 1989, Ser. No. 456,408
Int. Cl.[5] H01R *13/422*
U.S. Cl. 439—595 25 Claims



1. An electrical connector housing assembly comprising an insulating housing having a terminal receiving rear face, a front face opposite thereto, a first array of terminal receiving first through cavities, each cavity opening into both of said front and rear faces, and a terminal locking, insulating insert for locking an electrical terminal in each cavity; characterized in that each cavity is provided with a terminal latching lance formed integrally with the housing and extending longitudinally of the cavities, the housing having an intermediate face between the front and rear faces and from which said latching lances extend, the length of each cavity between the front face and the intermediate face being in the form of a first array of first open channels; and in that said insulating insert has a first array of second open channels each of which is complementary with a respective first open channel, said insert being insertable into the housing so that each first open channel cooperates with a second open channel to define an open ended passageway.

4,963,107

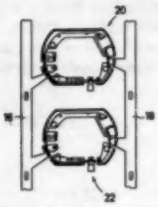
GRID MADE OF ELECTRICALLY CONDUCTING SHEET METAL

Walter Koster, Ganderkesee, Fed. Rep. of Germany, assignor to Schunk Motorensysteme GmbH, Ganderkesee, Fed. Rep. of Germany

Filed Mar. 31, 1989, Ser. No. 330,897
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3810963
Int. Cl.[5] H01R *9/24*
U.S. Cl. 439—884 11 Claims

1. A grid (22, 30) made of electrically conducting sheet metal for the connection of especially an electromotor such as an electric tool or a sash lifter, with areas electrically separated

from each other forming conductor paths, which can extend in different planes, characterized in that the grid (22, 30) is an at



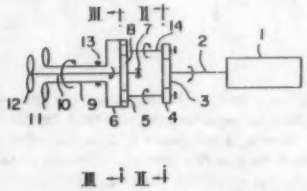
least single-stage, deep-drawn part enabling substantially unrestricted defining of the conductor paths.

4,963,108

MARINE CONTRA-ROTATING PROPELLER DRIVE SYSTEM

Masatoshi Koda, and Kazuyuki Araki, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1989, Ser. No. 442,985
Claims priority, application Japan, Nov. 30, 1988, 63-303769
Int. Cl.[5] B63H *23/24*
U.S. Cl. 440—81 3 Claims



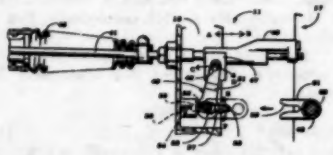
1. A marine contra-rotating propeller drive system comprising a large gear driven by an engine, a plurality of small gears disposed so as to respectively mesh with said large gear at a plurality of fixed positions about a circumferential portion of said large gear, a plurality of planet gears respectively mounted to gear shafts of said small gears, a sun gear and an inner-toothed gear respectively meshed with said planet gears, a rear propeller being mounted to an inner shaft serving as a gear shaft of said sun gear, and a front propeller being mounted to a tubular outer shaft serving as a gear shaft of said inner-toothed gear.

4,963,109

SHIFTING DEVICE FOR MARINE PROPULSION UNIT

Kenichi Hayasaka, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 276,062, Nov. 25, 1988, abandoned.
This application Mar. 9, 1990, Ser. No. 492,253
Claims priority, application Japan, Nov. 26, 1987, 62-298807
Int. Cl.[5] B63H *21/21*
U.S. Cl. 440—75 7 Claims



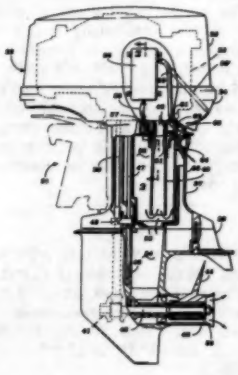
1. In a shifting mechanism for an outboard drive adapted to be affixed to the transom of a watercraft, said outboard drive having a selectably engageable transmission including a clutch member moveable between an engaged position and a disengaged position, a shift operator member, and shift linkage having an intermediate element operably connected to said shift operator member by a first motion transmitting means including an input element for transmitting motion of said shift operator member into movement of said input element and said intermediate element, second motion transmitting means including an output element operably connected to said intermediate element for transmitting movement of said intermediate element into movement of said clutch member, each of said motion transmitting means being effective to translate reciprocation of said shift operator member into rotation of an operably connected element, the improvement comprising detent means acting directly on one of said elements for yieldable retaining said shift linkage in a position corresponding to one of the positions of said clutch member independent of said operator member and said clutch member.

4,963,110

EXHAUST SYSTEM FOR MARINE PROPULSION

Hiroaki Otani, and Naoto Matsumoto, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 14, 1988, Ser. No. 257,708
Claims priority, application Japan, Oct. 16, 1987, 62-261443
Int. Cl.[5] B63H *21/32*
U.S. Cl. 440—89 12 Claims



1. In an outboard motor comprised of a powerhead having an internal combustion engine having an outer periphery, a surrounding protective cowling encircling said outer periphery of said engine and defining a cavity therebetween, said engine having a lower surface through which an exhaust port extends for discharging exhaust gases from said engine, a drive shaft housing and lower unit depending from said powerhead and containing propulsion means driven by said engine, an expansion chamber formed within said drive shaft housing, first conduit means for conveying exhaust gases from said exhaust port to said expansion chamber, and an exhaust gas discharge in said lower unit for discharging exhaust gases to the atmosphere from said expansion chamber, the improvement comprising a separable external expansion chamber contained within said powerhead internally of said protective cowling and externally of said engine outer periphery and above said engine lower surface and detachably supported upon said engine, and second conduit means for conveying exhaust gases from said expansion chamber to said external expansion chamber.

4,963,111

WATER VEHICLE HULL WITH A COMPLIANT LOWER PORTION

Olivier Moulin, 13 chemin due Plan-du-Loup, Saint-Foy-les-Lyon, France 69110

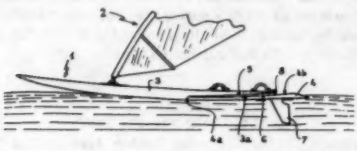
PCT No. PCT/FR87/00476, § 371 Date Jul. 12, 1988, § 102(e) Date Jul. 12, 1988, PCT Pub. No. WO88/03890, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 27, 1987, Ser. No. 229,856

Claims priority, application France, Nov. 28, 1986, 86 16865

Int. Cl.[5] B63B 35/79

U.S. Cl. 441—74 10 Claims



1. A hull for a water vehicle comprising a main portion and auxiliary portion, said main portion having front and rear sections, the hull being of a first length, said auxiliary portion being connected to said main portion so as to be in generally opposing relationship with respect to said rear section thereof, said rear section of said main portion and said auxiliary portion having opposing faces, a slot defining a spacing between said opposing faces of said auxiliary portion and said rear section of said main portion, said slot extending at least one third of the first length of the hull, said auxiliary portion and rear section of said main portion being relatively yieldable with respect to one another so as to vary the spacing therebetween, a double-acting damping means mounted within said slot, said double-acting damping means including a pressurized resilient vessel installed between said opposing faces of said rear section and said auxiliary portion, an elastic membrane encircling said vessel and defining a chamber, said chamber including an evacuation valve for selectively opening said chamber to atmosphere and an inlet orifice for permitting air to enter said chamber.

4,963,112

METHOD OF PRODUCTION OF A SPARK PLUG FOR INTERNAL COMBUSTION ENGINES

Walter Benedikt, Korntwestheim; Karl-Hermann Friese, Leonberg; Werner Herden, Gerlingen; Dietrich Schuldt, Korntal, and Leo Steinke, Waiblingen-Hegnach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

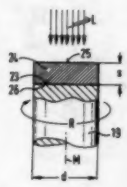
PCT No. PCT/DE88/00435, § 371 Date Apr. 6, 1989, § 102(e) Date Apr. 6, 1989, PCT Pub. No. WO89/01717, PCT Pub. Date Feb. 23, 1989

PCT Filed Jul. 14, 1988, Ser. No. 340,003

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1987, 3727526

Int. Cl.[5] H01T 21/02

U.S. Cl. 445—7 12 Claims



1. A method of producing a spark plug for internal combustion engines and comprising at least two metal electrodes located opposite one another in a spaced relationship and forming a spark gap therebetween with at least one metal electrode having a metal coating of a high wear-resistant noble material on an end face thereof facing the spark gap and an intermediate layer containing materials of the metal coating and the metal electrode, said method comprising the steps of:

arranging a metal piece formed of a noble metal on the spark gap facing end face of the at least one metal electrode; and

directing laser beams onto an outer surface of the metal piece facing the spark gap to form an alloy zone between the metal electrode and a wear-resistant layer facing the spark gap, and consisting of materials of the metal electrode and the metal piece, and comprising a first layer-formed area abutting the metal electrode and consisting only of a material of the metal electrode, and a second layer-formed area abutting the wear-resistant layer and consisting of a material of the metal piece, a proportion of the material of the center electrode in the alloy zone decreasing continuously from the first layer-formed area to the second layer-formed area.

4,963,113

METHOD FOR PRODUCING PHOTOMULTIPLIER TUBE

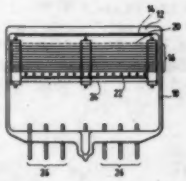
Shinichi Muramatsu, Shizuoka, Japan, assignor to Hamamatsu Photonics K.K., Shizuoka, Japan

Filed Aug. 1, 1989, Ser. No. 388,034

Claims priority, application Japan, Aug. 1, 1988, 63-195195

Int. Cl.[5] H01J 9/12

U.S. Cl. 445—58 12 Claims



1. A method of producing a photomultiplier tube including a vacuum container having an incident window, a photocathode formed on the inner surface of the incident window and an electron multiplier element spaced from the photocathode, comprising the steps of:

providing a mesh electrode with a constituent for forming the photocathode in advance;

arranging the mesh electrode provided with the constituent between the inner surface of the incident window and the electron multiplier element; and

depositing the constituent of the mesh electrode on the inner surface of the incident window.

4,963,114

PROCESS FOR FABRICATION OF HIGH RESOLUTION FLAT PANEL PLASMA DISPLAYS

Nicholas C. Andreadakis, Readington Township, Hunterdon County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Continuation-in-part of Ser. No. 125,398, Nov. 25, 1987, abandoned, which is a continuation-in-part of Ser. No. 914,775, Oct. 3, 1986, abandoned. This application Jul. 10, 1989, Ser. No. 377,486

Int. Cl.[5] H01J 9/20, 61/62

U.S. Cl. 445—25 7 Claims

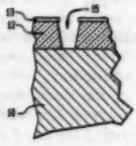
1. A method of fabricating a display panel comprising the steps of

forming a substrate comprising a lead-free silicate glass,

depositing a lead-containing dielectric layer on the top surface of said substrate,

establishing a masking pattern on the top surface of said dielectric layer to delineate an array of regions in which plasma display cavities are to be formed,

etching cavities in said dielectric layer with fluoboric acid in the regions delineated by said pattern, which acid is relatively effective to etch said lead-containing dielectric layer and relatively ineffective to etch the surface of said lead-free substrate, whereby said cavities are etched



through the entire thickness of said dielectric layer to the top surface of said substrate without causing any substantial etching of the surface of said substrate,

providing a cover over said cavities to form an enclosed display panel adapted to contain ionizable gas in said cavities,

and providing an array of electrodes adjacent said cavities for ionizing the gas in selected ones of said cavities.

4,963,115

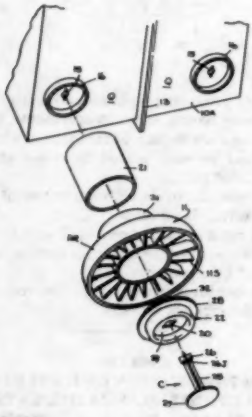
MULTIPURPOSE CONTAINER TOY WITH MOUNTABLE WHEELS

Stowell Davin, New York, and Jean M. Gerth, Brooklyn, both of N.Y., assignors to Smart Design, Inc., New York, N.Y.

Filed Dec. 18, 1989, Ser. No. 452,051

Int. Cl.[5] **A63H** *17/00, 27/00;* **B62B** *1/04;* **B60B** *27/02*

U.S. Cl. 446—96 **14 Claims**



1. A construction toy set whose components are interconnectable to create various structures, depending on how the components are assembled, said set comprising:

(a) at least one open-top cubical box whose bottom and side walls are divided into quadrants, each having a keyhole therein encircled by a coupling collar projecting from the quadrant;

(b) a plurality of like cylindrical spacers which are fittable on respective collars and extend therefrom;

(c) a plurality of wheels having a cylindrical hub of substantially the same length as said spacers and a larger diameter, whereby each wheel may be slipped over a spacer extending from a coupling collar, the spacer then acting as an axle for the wheel;

(d) a plurality of like hub caps adapted to lie against an outer end of the spacer and against the hub of said wheel, each hub cap having a membrane with a center keyhole whose shape matches the quadrant keyhole; and

(e) a plurality of like connector bolts each having a shank whose length is substantially equal to that of said spacers and a key at the end of the shank which is shaped to be admissible in said quadrant keyhole and said membrane center keyhole, whereby when a connector bolt is inserted in the membrane center keyhole and the key passes through the quadrant keyhole, and the shank of the bolt then extends through a spacer, the connector bolt can be locked by turning the bolt to cause the key to fall out of registration with the quadrant keyhole.

4,963,116

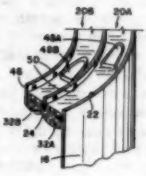
RACE WATER TRACK TOY

John J. Huber, 1614 S. Magnolia, Broken Arrow, Okla. 74012

Filed Oct. 10, 1989, Ser. No. 419,214

Int. Cl.[5] **A63H** *29/10, 23/00;* **A63G** *3/00;* **A63F** *9/14*

U.S. Cl. 446—176 **13 Claims**



1. A water track toy comprising:

a trough member providing a continuous elongated water carrying channel, one elongeted portion is said channel being formed of an envelope of thin plastic material, said envelope comprises a closed tubular portion extending the length of the channel;

means to direct a supply of water pressure into said trough to produce flow of water in said trough into which floating object may be placed; and

means of connecting water under pressure to expand said envelope to form a structural portion to at least in part support said trough portion.

4,963,117

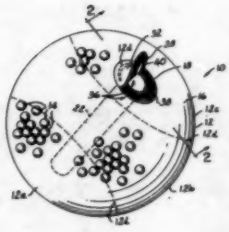
SELECTIVELY ILLUMINATED TOY BALL

Kevin G. Gualdoni, 16007 Bayham Dr., Mt. Clemens, Mich. 48044

Filed Oct. 30, 1989, Ser. No. 428,973

Int. Cl.[5] **A63H** *33/22, 17/28;* **A63B** *41/00*

U.S. Cl. 446—219 **9 Claims**



1. A toy ball for use in combination with at least one chemical light stick, said toy ball comprising:

a skin, said skin being pliant and light transmissible, said skin defining an interior space, said skin having an aperture, said aperture having a perimeter;

an interior sack located inside said skin, said interior sack being connected with said skin at the perimeter of said aperture, said interior sack being light transmissible, said aperture in said skin and said interior sack being dimensioned to permit said at least one chemical light stick to be fully inserted thereinto;

a plurality of light transmissible beads filling said interior space between said skin and said interior sack;

ventilation means connected with at least one of said skin and said interior sack for providing ventilation of said interior space; and

retaining means connected with said skin for releasably holding said at least one chemical light stick in said interior sack.

4,963,118

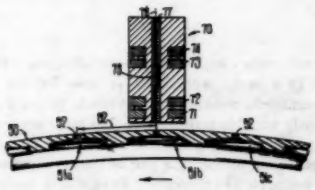
METHOD AND APPARATUS FOR COIN SORTING AND COUNTING

William L. Gunn, Atlanta; William D. Heath, Jr., Breman, and John C. Mantovani, Lilburn, all of Ga., assignors to Brink's Incorporated, Darien, Conn.

Filed Aug. 16, 1988, Ser. No. 232,898

Int. Cl.[5] G07D *3/16*

U.S. Cl. 453—3 **21 Claims**



17. A transformer for use in a sensor for identifying metallic objects comprising:

a non-ferromagnetic bobbin characterized by a longitudinal axis and a rectangular geometry in cross sections perpendicular to said longitudinal axis;

means defining at least four coil positions, comprising a first coil position, a second coil position, a third coil position, and a fourth coil position lying in planes perpendicular to said longitudinal axis and being disposed along said longitudinal axis at respectively increasing distances from a predetermined end of said bobbin;

a primary winding comprising a first coil and a second coil connected in series with said first coil to form a two terminal connection to said primary winding;

a secondary winding comprising a third coil and a fourth coil connected in series at a connection point;

means connecting said connection point to one terminal of said two terminal connection to said primary winding;

wherein said first coil is located at said second coil position, said second coil is located at said third coil position, said third coil is located at said first coil position, and said fourth coil is located at said fourth coil position.

4,963,119

TORSION DAMPING DEVICE INCLUDING VISCOUS DAMPING MEANS, IN PARTICULAR FOR AUTOMOTIVE VEHICLES

Michel Graton, Paris, France, assignor to Valeo, Paris, France

Filed Jan. 24, 1990, Ser. No. 469,922

Claims priority, application France, Feb. 3, 1989, 89 01388

Int. Cl.[5] F16D *13/68*

U.S. Cl. 464—24 **10 Claims**

1. A torsion damping device comprising: a hub; a first coaxial part including two guide rings surrounding the hub and defining an axially extending zone of the device; a second coaxial part including a damper plate, the guide rings being disposed on either side of the damper plate, with the hub, damper plate and guide rings together defining a sub-assembly and the said coaxial parts being coaxial with each other; and means partly on the hub and partly fixed with respect to a component or components, selected from the group consisting of the guide rings taken together and the damper plate, coupling the hub with the said component or components for rotation together but defining an initial clearance therebetween; resilient means arranged between said coaxial parts; and damping means arranged between said coaxial parts, the device including means mounting the two coaxial parts for rotational movement with respect to each other within the limits of a predetermined angular displacement against the action of the said resilient means and damping means, wherein the damping means consist of dry friction damping means and a viscous damping means, the dry friction damping means being operatively connected between the damper plate and guide rings, and comprising a bearing extending radially between one said guide ring and the hub, the viscous damping means being outside the said zone and comprising a housing and means entirely within the housing for effecting viscous damping, the housing comprising two portions with means mounting said housing portions for rotational movement with respect to each other, the device further including viscous damper coupling means, coupling one said housing portion to the guide rings and the other said housing portion to the damper plate, whereby the housing is attached to the said sub-assembly and is coupled thereto for rotation therewith after an initial clearance has been taken up.

4,963,120

PERSON POWERED VEHICLE AUTOMATIC TRANSMISSION

Ralph A. Meyering, 1369 Somerset, Grosse Pointe Park, Mich. 48230

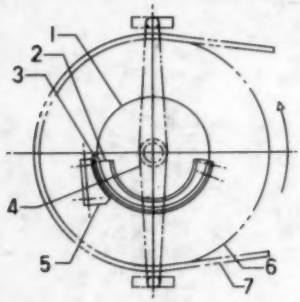
Filed Sep. 26, 1988, Ser. No. 249,581

Int. Cl.[5] F16H *9/00*

U.S. Cl. 474—69 **1 Claim**

1. A vehicle drive that imparts a sudden force from at least

one spring rotating with at least one retainer and a hub to a driver, said driver rotating with a sprocket that rotates on and relative to said hub, said vehicle drive comprising a retainer bolted to said hub, said spring being bolted at one end to an end of retainer, said driver being bolted to said sprocket, said sprocket transmitting torque by means of a chain drive for propelling the vehicle, said sprocket being rotatable on the hub



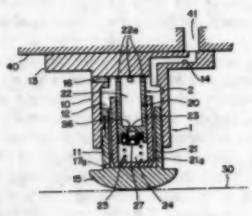
and being retained sideways thereon by said retainer, and a guide member bolted to said hub, whereby during part of a revolution of said hub, said spring contacts said driver with increasing springs force, and for the remainder of the revolution less spring force being required to overcome friction between the sprocket and the hub and to build up energy to subsquently impact said driver.

4,963,121

LIQUID PRESSURE TENSIONER

Masato Himura, and Hiroshi Suzuki, both of Hadano, Japan, assignors to Nittan Valve Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1989, Ser. No. 425,048
Claims priority, application Japan, Sep. 7, 1987, 62-135484
Int. Cl.[5] F16H *7/08*
U.S. Cl. 474—110 **6 Claims**



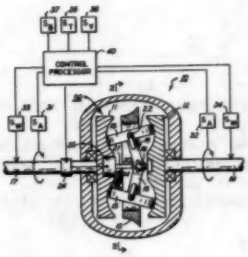
1. A liquid pressure tensioner for a driving gear mechanism including an endless member engaging driving and driven gears, said tensioner comprising a tubular frame body having an inner surface defining a hollow space for receiving an operating fluid, an outer surface, and an open end; a tubular projecting member slidably displaceable along one of said inner and outer surfaces and including an end portion projecting beyond said open end of said tubular frame body and having a slip end surface for engaging the endless member and an open cavity; and a liquid pressure unit received at least partially within said open cavity of said tubular projecting member and including a first tubular member defining a reservoir for storing the operating fluid, a second tubular member slidable relative to said first tubular member, a variable hollow space formed between said first and second tubular members and defining a higher pressure chamber, conduit means for communicating said reservoir with said high pressure chamber, and check valve means located in said conduit means to prevent flow of fluid from said high pressure chamber into said reservoir.

4,963,122

CONTINUOUSLY VARIABLE DIFFERENTIAL

Thomas B. Ryan, Webster, N.Y., assignor to The Gleason Works, Rochester, N.Y.

PCT No. PCT/US87/01330, § 371 Date Jun. 4, 1987, § 102(e) Date Jun. 4, 1987, PCT Pub. No. WO88/09886, PCT Pub. Date Dec. 15, 1988
PCT Filed Jun. 4, 1987, Ser. No. 62,942
Int. Cl.[5] F16H *59/46*
U.S. Cl. 475—184 **20 Claims**



1. A continuously variable torque apportioning system for a differential in a motor vehicle drive train having an input element operatively connected to a vehicle power source and a continuously variable transmission that can vary speed ratio throughout a continuum of values, said system comprising:

said transmission including a pair of output elements operatively connected to respective drive shafts, and a housing of said transmission being mounted for rotation in response to rotation of said input element ;

a continuously varaible speed ratio path being rotated with said housing, opposite ends of said speed ratio path being operatively connected with said output elements for rotating said output elements with said housing and said speed ratio path and for permitting counter-directional rotation of said output elements with respect to said housing, variation of said speed ratio throughout said continuum of values being applied within said transmission to said speed ratio path between said output elements;

sensors for sensing conditions affecting operation of said motor vehicle;

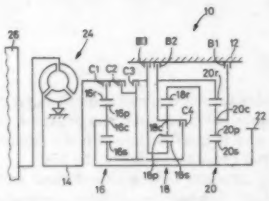
a processor for processing information obtained from said sensors on operating conditions of said motor vehicle for determining an apportionment of torque between said output elements appropriate for such operating conditions; and

said processor being operatively connected with said transmission for varying said speed ratio of said path between said output elements to effect said apportionment of drive torque between said drive shafts, said drive torque apportionment being an inverse function of said speed ratio and being independent of differential rotation of said drive shafts.

4,963,124
PLANETARY GEAR TRANSMISSION FOR MOTOR VEHICLE

Tokuyuki Takahashi, Aichi; Seitoku Kubo, Toyota; Hiroshi Itoh, Toyota, and Masayuki Fukai, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 6, 1989, Ser. No. 418,259
Claims priority, application Japan, Oct. 26, 1988, 63-270150; Feb. 4, 1989, 1-26473
Int. Cl.[5] F16H *57/10*
U.S. Cl. 475—278 **11 Claims**



1. A planetary gear transmission for a motor vehicle, including an input member, an output member, a stationary member, a first single-pinion type planetary gear unit having a first sun gear, a first planetary gear, a first carrier rotatably supporting the first planetary gear, and a first ring gear, a second single-pinion type planetary gear unit having a second sun gear, a second planetary gear, a second carrier rotatably supporting the second planetary gear, and a second ring gear, and a third single-pinion type planetary gear unit having a third sun gear, a third planetary gear, a third carrier rotatably supporting the third planetary gear, and a third ring gear, said first, second and third planetary gear units being disposed coaxially with each other in the order of description, for transmitting power from said input member to said output member, at a selected one of different speed reduction ratios, wherein the improvement comprises:

said first carrier, said second ring gear, said third sun gear and said output member being connected to each other for rotation as a unit during operation of the transmission, while said second carrier and said third ring gear are connected to each other for rotation as a unit during operation of the transmission;

a first coupling device for connecting said first ring gear to said input member;

a second coupling device for connecting said first sun gear to said input member;

a third coupling device for connecting said first sun gear to said second sun gear;

a fourth coupling device for connecting said first sun gear to said second carrier and said third ring gear;

a fifth coupling device for fixing said third carrier to said stationary member;

a sixth coupling device for fixing said second carrier and said third ring gear to said stationary member; and

a seventh coupling device for fixing said second sun gear to said stationary member.

4,963,125
METHOD OF MAKING PROMOTIONAL POP-UP

John K. Volkert, Northfield, Ill., assignor to One-Up, Inc., Northfield, Ill.

Continuation-in-part of Ser. No. 225,250, Jul. 28, 1988. This application Aug. 23, 1988, Ser. No. 235,299
Int. Cl.[5] B31D *5/00, 5/04*
U.S. Cl. 493—334 **9 Claims**

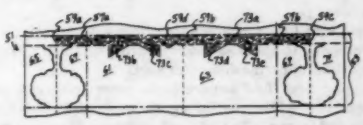
1. A method of making pieces containing a pop-up structure from a continuous web, which method comprises steps of:

providing a continuous web of printed sheet material designed to produce a series of interconnected blanks each extending transversely of said continuous web, said blanks each including a pair of basepieces and a pair of pop-up panels which pop-up panels are connected to each other along a common line,

applying adhesive to selective locations on said moving web;

manipulating a portion of said web so that one pop-up panel at least partially overlies the other pop-up panel creating a double-thickness portion of said web,

die-cutting said double-thickness portion of said web along a contoured line to create at least one similarly contoured edge along both said pop-up panels without at the same time cutting the web portion constituting said basepieces,



displacing said die-cut pop-up panels having said similarly contoured edges to position them atop one of said basepieces,

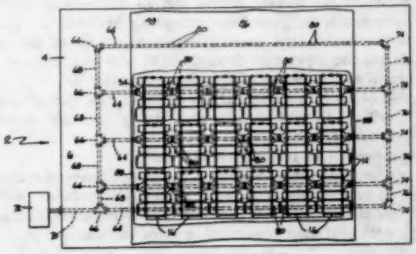
thereafter manipulating said web to superimpose said basepieces atop each other with said pop-up panels sandwiched therebetween, and

cutting said web transversely of the series of manipulated blanks to create a plurality of structurally identical flat individual pieces each containing a pop-up structure that moves away from the respective planes of both basepieces when piece is opened by pivoting said basepieces along a straight hinge line of interconnection therebetween, said pop-up panels forming a construction wherein said similarly contoured edges of the pop-up structure present an attractive appearance.

4,963,126
METHOD AND APPARATUS FOR FORMING CARTON BLANKS

Norman L. Jesch, Lafayette, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed May 5, 1989, Ser. No. 347,661
Int. Cl.[5] B31B *1/16, 1/25, 1/12*
U.S. Cl. 493—354 **14 Claims**



1. Method for cutting carton blanks from a continuous sheet of a composite material having at least a fluid permeable base and a fluid impermeable outer surface comprising:

mounting an upper die at a fixed position having rule means on the front surface thereof for defining cutting lines and score lines;

mounting a lower platen for reciprocal movement toward or away from said upper die and having an upper surface for cooperating with said upper die and lower platen to form cut and score lines;

feeding a continuous sheet of a composite material comprising said fluid permeable base facing said lower platen and said fluid impermeable outer surface facing said upper die into position between said upper die and said lower die by moving said continuous sheet in successive incremental amounts to locate each succeeding incremental amount between said lower platen and said upper die;

moving said lower platen into contact with said fluid permeable base and applying pressure thereto to move said fluid permeable base toward said upper die so as to form cut lines and score lines in said composite material base defining a plurality of carton blanks;

applying downwardly directed forces onto said fluid impermeable outer surface to minimize any upwardly directed movement of portions of said fluid impermeable outer surface;

moving said lower platen away from said upper die while continuing to apply said downwardly directed forces onto said fluid impermeable outer surface;

separating said fluid impermeable outer surface from said upper die while continuing to apply said downwardly directed forces onto said fluid impermeable outer surface;

moving said continuous sheet in the next incremental amount while continuing to apply said downwardly directed forces; and

stripping said carton blanks from said continuous sheet.

7. Apparatus for cutting and creasing carton blanks from a continuous sheet of a composite material having at least a fluid permeable base and a fluid impermeable outer surface comprising:

an upper die comprising a rectangularly shaped block of material having lower and upper surfaces and mounted at a fixed location;

a lower platen mounted opposite to said upper die and for reciprocal movement toward or away from said upper die;

feeding means for feeding said continuous sheet of a composite material in incremental amounts so as to position each succeeding incremental amount of said continuous sheet between said lower platen and said upper die;

cutting rules and creasing rules mounted in said rectangularly shaped block so that portions thereof extend downwardly from said lower surface and are adapted to contact said fluid impermeable outer surface to cooperate with said lower platen in forming cuts and grooves in said composite material;

force applying means for applying a downwardly directed force at least on the portion of said fluid impermeable outer surface under said upper die to minimize any upwardly directed movement of portions of said fluid impermeable outer surface at least during the feeding of said incremental amount of said composite material into position between said lower platen and said upper die and during the movement thereof out of said position; and

wherein said force applying means comprise:

said block of material having a plurality of spaced apart orifices formed therein and having openings in said lower surface;

a supply of air under pressure; and

connecting means for connecting said plurality of orifices to said supply of air so that air under pressure issues from said orifices and moves downwardly into contact with said fluid impermeable outer surface.

4,963,127

STANNIC TEREPHTHALATE

Richard F. Grossman, Shelton, Conn., and David M. Tanno, Richmond Heights, Ohio, assignors to Synthetic Products Company, Cleveland, Ohio

Continuation of Ser. No. 226,318, Jul. 27, 1988, abandoned. This application May 24, 1989, Ser. No. 357,612

Int. Cl.[5] C07F *7/22*

U.S. Cl. 556—106 **1 Claim**

1. Stannic terephthalate.

4,963,128

CHEST TUBE AND CATHETER GRID FOR INTRATHORACIC AFTERLOAD RADIOTHERAPY

Thomas M. Daniel, and Seung S. Hahn, both of Charlottesville, Va., assignors to University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Filed Mar. 21, 1989, Ser. No. 326,733

Int. Cl.[5] A61M *36/12*

U.S. Cl. 600—7 **9 Claims**

1. An apparatus for internal radiation therapy, comprising:

a semi-rigid tube having a distal and proximal end, wherein the distal end is inserted into a body cavity, while the proximal end remains outside of the body;

a plurality of catheters having closed distal ends and open proximal ends, wherein the catheters are inserted into the semi-rigid tube so that the distal ends of the catheters extend outwardly from the distal end of the semi-rigid tube for a predetermined distance, and wherein the open proximal ends of the catheters extend outwardly from the proximal end of the semi-rigid tube and are located on the outside of the body; and

a soft sheet to which the distal ends of the catheter tubes are attached so that the catheter tubes maintain a parallel position to one another over the predetermined distance,

wherein the semi-rigid tube has a diameter of sufficient size so that when the catheters are inserted into the semi-rigid tube, the semi-rigid tube is capable of performing as a drainage tube.

4,963,129

SYSTEM FOR THE DRAINAGE OF BODY CAVITIES

Heinz Rusch, Waiblingen, Fed. Rep. of Germany, assignor to Willy Ruesch AG, Fed. Rep. of Germany

Filed Sep. 6, 1989, Ser. No. 407,433

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1988, 3831652

Int. Cl.[5] A61M *25/00*

U.S. Cl. 604—8 **9 Claims**

1. System for the drainage of body cavities, in particular the renal cavity system, consisting of a flexible drainage tube with at least one crooked end, a tubular device, called pusher, serving to push the drainage tube into a body cavity, a distal end of which is connected in a separable manner with a proximal end of the drainage tube, and a guide wire permeating the drainage

tube and the pusher, wherein the ends of the drainage tube (1) and the pusher (2), which are connected with each other, have parts (41, 42) of a lock (4), which are complementary to each other, and which feature sections (45, 46) overlapping each other, which sections (45, 46) are equipped with face sections adjacent to each other and suitable for the transmission of axial traction forces and a torque, and are held in mesh by the guide wire (3) permeating them.

4,963,130

INTRA-PERITONEAL PERFUSION OF OXYGENATED FLUOROCARBON

Jewell L. Osterholm, Radnor, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Continuation of Ser. No. 757,015, Jul. 19, 1985, Pat. No. 4,657,532. This application Nov. 18, 1986, Ser. No. 932,459

Int. Cl.[5] A61M *21/00*

U.S. Cl. 604—24 **2 Claims**

1. A method of oxygenating the tissue of a living mammal, comprising the steps of:

(a) providing an oxygenated fluorocarbon containing liquid;

(b) injecting said oxygenated fluorocarbon liquid into the peritoneal cavity of said mammal;

(c) withdrawing said liquid from said cavity;

said injecting and withdrawing being conducted at a rate sufficient to oxygenate at least a portion of the tissue of said mammal, wherein said oxygenated fluorocarbon liquid comprises an oxygenated fluorocarbon containing aqueous emulsion.

4,963,131

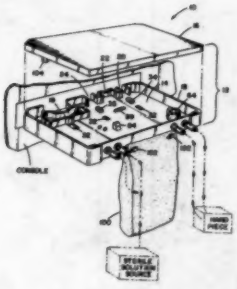
DISPOSABLE CASSETTE FOR OPHTHALMIC SURGERY APPLICATIONS

Theodore S. Wortrich, Long Beach, Calif., assignor to Surgin Surgical Instrumentation, Inc., Placentia, Calif.

Filed Mar. 16, 1989, Ser. No. 324,018

Int. Cl.[5] A61M *1/00*

U.S. Cl. 604—34 **13 Claims**



1. A cassette for sterile engagement with at least one tubing section to be clamped by an external actuator when the cassette is inserted into an associated mechanism, comprising:

a cassette housing having a first external edge for engagement proximate at least one actuator element when inserted in the mechanism;

means within the housing providing at least one backup surface proximate an external edge surface of the housing when the cassette is inserted;

means disposed at the external edge surface of the housing for coupling tubing in and out of the cassette, the tubing being arranged within the housing with at least one section adjacent the backup surface; and

at least one slider element spanning from the first edge within the housing to at least one backup surface, to clamp the associated tubing section therebetween when the actuator element is operated within the mechanism.

4,963,132

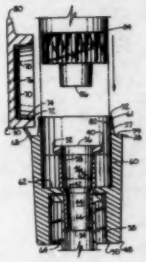
CAPPED FLUIDIC CONNECTOR

Roger M. Gibson, 3446 NE. Kincaid, Topeka, Kans. 66617

Continuation-in-part of Ser. No. 276,040, Nov. 11, 1988, abandoned. This application Sep. 13, 1989, Ser. No. 406,915

Int. Cl.[5] A61M *3/00*

U.S. Cl. 604—256 **2 Claims**



1. A capped fluid connector, which includes:

(a) a connector body including:

(1) an inner tubular member with a proximal tapered male end and a distal, externally-threaded end;

(2) an inner tubular member bore extending coaxially therethrough and open at said proximal and said distal ends;

(3) said inner tubular member including a proximal section terminating at said proximal end and a distal section terminating at said distal end;

(4) an outer tubular member including a bore with internal, female threads, said bore being sealed and terminating at an annular plug with a distal face, said annular plug connected to said inner tubular member between the proximal and distal sections thereof, said outer tubular member having a proximal end, said outer tubular member bore being open at its proximal end;

(5) said inner tubular member proximal end being located within said outer tubular member bore; and

(6) said distal face including first connecting means;

(7) said inner tubular member distal section projecting distally from said annular plug distal face; and

(8) an annular clearance space between said outer tubular member and said inner tubular member proximal section within said outer tubular member bore; and

(b) a cap including:

(1) a closed top;

(2) a sidewall extending from said top to a free, annular bottom edge;

(3) a bore including a closed end adjacent to said top and an open end adjacent to said sidewall free edge, said bore being annularly surrounded by said sidewall;

(4) said side wall including second connecting means adjacent said cap bore, said second connecting means comprising an annular groove open inwardly adjacent to said sidewall free edge;

(5) a flexible hinge strap extending between said outer tubular member distal end and said sidewall;

(6) a finger tab extending outwardly from said connector cap top;

(7) said cap being movable through an arc of approximately 180° between an open position spaced outwardly from said connector body and a closed position with said first connecting means releasably received in said cap sidewall groove and said inner tubular member distal section received in said cap bore; and

(8) said cap bore having a depth greater than a length of said inner tubular member distal section.

4,963,133

CATHETER ATTACHMENT SYSTEM

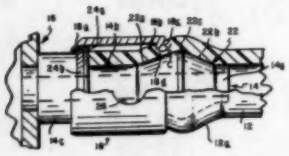
Gary R. Whipple, South Attleboro, Mass., assignor to Pharmacia Deltec, Inc., St. Paul, Minn.

Continuation of Ser. No. 140,026, Dec. 31, 1987, Pat. No. 4,880,414. This application Aug. 8, 1989, Ser. No. 390,839

The portion of the term of this patent subsequent to Nov. 14, 2006, has been disclaimed.

Int. Cl.[5] A61M *25/00*

U.S. Cl. 604—283 **20 Claims**



1. Connection apparatus comprising

A. a relatively rigid elongated stem, said stem having a free end, an opposite end and means defining an enlargement on the exterior surface of the stem at a selected location between said ends;

B. a flexible elastic tube having a lumen for elastically receiving a lengthwise segment of said stem including said enlargement thereof, said enlargement having a maximum diameter appreciably larger than that of the lumen so that when said stem segment is received in the lumen, said tube is stretched conformingly around said stem enlargement; and

C. tubular retainer means slidably received on said stem between said tube opposite end and said enlargement, said retainer means including radially extending rigid flange means at or near a distal end of said retainer means that faces said enlargement, said flange means having a fixed diameter so that when said stem segment is received in the tube lumen and said retainer means are slid toward the free end of said stem, said flange means compressively engage the elastically stretched wall of said tube at a contact surface that encircles a segment of said enlargement.

4,963,134

LASER SURGERY PLUME EVACUATOR WITH ASPIRATOR

Frank A. Backscheider, Batavia, and Paul Rogers, Cincinnati, both of Ohio, assignors to United States Medical Corporation and Recto Molded Products, Inc., both of Cincinnati, Ohio

Filed Mar. 3, 1989, Ser. No. 319,121

Int. Cl.[5] A61M *1/00*

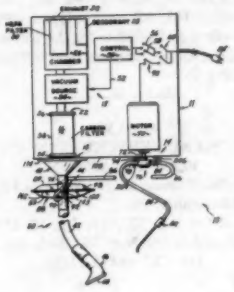
U.S. Cl. 604—319 **31 Claims**

1. A method of evacuating and aspirating a laser surgery site comprising:

evacuating through a vacuum filter assembly plume generated during a laser surgical procedure;

aspirating through an aspirator pump assembly fluid containing liquid and plume generated during the laser surgical procedure; and

ventilating at least a portion of plume aspirated into said aspirator pump assembly to said vacuum filter assembly to



pass such aspirated plume portion through said vacuum filter assembly.

4,963,135

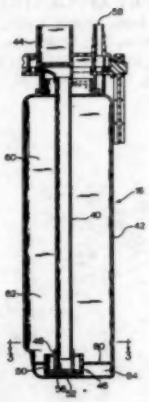
FLOATATION CHAMBER FOR USE IN A CHEST DRAINAGE DEVICE

Michael J. Kerwin, St. Louis, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.

Filed Jun. 9, 1989, Ser. No. 363,749

Int. Cl.[5] A61M *1/00*

U.S. Cl. 604—320 **21 Claims**



1. A chest drainage device for removing fluids and gases from the body of a patient comprising,

a collection chamber in flow communication with the body of a patient wherein fluids from the body of a patient will be collected therein,

a source of vacuum pressure in flow communication with said collection chamber to apply a desired vacuum pressure to the body of a patient to draw fluids into said collection chamber,

a liquid containing suction control chamber in flow communication with the atmosphere and said source of vacuum pressure,

said suction control chamber having first and second columns formed therein and said first and second columns having top ends and bottom ends and wherein said bottom ends are in flow communication with each other and said top end of said first column is in flow communication with

the atmosphere and said top end of said second column is in flow communication with said source of vacuum pressure, and

a float means in flow communication with said first column wherein said float means selectively restricts the flow of fluid in said suction control chamber to regulate the amount of vacuum pressure applied to the body of a patient by said source of vacuum pressure.

4,963,136

COUPLING FOR ATTACHING AN OSTOMY OR POUCH TO A MEDICAL GRADE ADHESIVE PAD

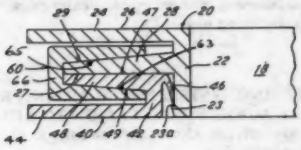
Peter L. Steer, Reigate, and Neil P. Wiltshire, Lingfield, both of England, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 4, 1989, Ser. No. 333,055

Claims priority, application United Kingdom, Apr. 15, 1988, 8808894

Int. Cl.[5] A61F 5/44

U.S. Cl. 604—339 **4 Claims**



1. An ostomy coupling includes two cooperating coupling elements of closed loop form extending completely around a stomal orifice at the center of the coupling, one for attachment to a pad of medical grade adhesive and the other for attachment to an ostomy pouch, one of said coupling elements including a substantially cylindrical chute member extending around said stomal orifice and the other including an upstanding portion with a flexible deflectable seal strip which engages the radially outer wall of said chute member to provide a seal when the coupling elements are coupled together, in which each coupling element includes a tapering member, each such member tapering in a radially outward direction from, and formed integrally with, said chute member and said upstanding portion, respectfully, and having a flat surface located in a plane at right angles to the coupling axis, the coupling also having a means of clamping which can be tightened onto the tapering members to hold them together so that their respective flat surfaces are in face-to-face arrangement, whereby the two coupling elements can be held together and released without the application of any axial pressure forces or pulling forces to the wearer, said clamping means comprising a U-shaped channel in which the inside walls of the U-shaped channel are tapered to be complimentary to the tapered surfaces of the tapering members.

4,963,137

DEVICE FOR URINE DRAINAGE

Eugene L. Heyden, S. 627 Bernard, #8, Spokane, Wash. 99204

Continuation of Ser. No. 70,078, Jul. 6, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 312,386

Int. Cl.[5] A61F 5/44

U.S. Cl. 604—349 **14 Claims**

1. A device for urine drainage which is moldably conformable about a penis and adhesively securable thereto, comprising:

a generally tubular sheath of one-piece construction and of flexible material presenting a wall formed continuously about a longitudinal axis and including

a forward portion of longitudinal extent internally defining a fluid passage means, and

a substantially shape-retaining rearward portion of longitudinal extent emerging from said forward portion and generally progressively enlarging in circumference substantially its entire length as it progresses longitudinally away from an internally defined forward discharge opening means common to both forward and rearward portions of said sheath, said rearward portion having an inner wall surface and existing in fluid communication with said fluid passage means by means of said forward discharge opening; and

adhesive means located on a substantial amount of the inner wall surface of said rearward portion,

whereby said rearward portion may adhesively engage the penis and adhesively join together portions of said inner wall surface in order to moldably conform about the penis wherein said rearward portion is of a dimension to loosely receive the penis.

4,963,138

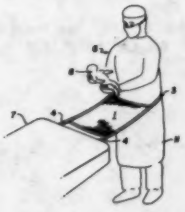
NEO-NATAL NET

Nohl A. Braun, Jr., and Mary J. Urling, both of 1402 Mt. Vernon Rd., Charleston, W. Va. 25314

Filed Jun. 13, 1988, Ser. No. 209,889

Int. Cl.[5] A61B 17/42

U.S. Cl. 604—356 **3 Claims**



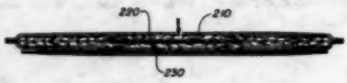
1. A neo-natal safety net connected between the end of a delivery table and the end of a neo-natal table spaced from said delivery table comprising, a net, a pair of straps secured to opposite sides of the net, the pair of straps on one side of the net connecting the net to the end of the delivery table, and the pair of straps on the other side of the net connecting the net to the end of the neo-natal table, whereby the net is suspended over the space between the delivery table and the neo-natal table in substantially a horizontal plane extending between the ends of the tables, to thereby provide a safety net for catching a newborn infant in the event that the baby accidentally slips from the hands while being handled during post-natal care.

4,963,139

ABSORBENT BODY HAVING HYDROPHOBIC INSERT

Winifred C. Dabroski, East Brunswick, N.J., assignor to McNeil-PPC, Inc., Milltown, N.J.

Filed Sep. 22, 1988, Ser. No. 247,479
Int. Cl.[5] A61F 13/16
U.S. Cl. 604—378 15 Claims



1. An absorbent article having oppositely disposed ends and longitudinal edges, comprising:

(a) a fluid permeable cover with a body contacting surface;

(b) a first absorbent layer subjacent to said cover having oppositely disposed longitudinal edges, and oppositely disposed transverse edges, a body facing side and a garment facing side;

(c) a fluid repellent layer underlying said first absorbent layer having oppositely disposed longitudinal edges and oppositely disposed transverse edges, the distance between said longitudinal edges being substantially the same as or greater than that of the first absorbent element and the distance between said transverse edges being substantially equal to or less than that of said first absorbent element; a second absorbent element having oppositely disposed longitudinal edges and oppositely disposed transverse edges, underlying said fluid repellent layer the distance between said transverse edges being greater than that of said fluid repellent layer;

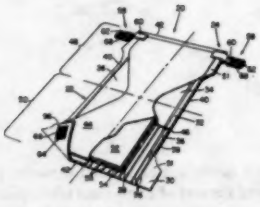
whereby in use, said first and said second absorbent layers are substantially separated a distance along their longitudinal edges such that fluid striking said first absorbent layer is substantially prevented from flowing around the longitudinal edges and substantially flows along the longitudinal direction of the absorbent article toward the transverse edges into said second absorbent element.

4,963,140

MECHANICAL FASTENING SYSTEMS WITH DISPOSAL MEANS FOR DISPOSABLE ABSORBENT ARTICLES

Anthony J. Robertson, Blue Ash, Ohio, and Charles L. Scripps, Brookfield, Wis., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 17, 1987, Ser. No. 134,275
Int. Cl.[5] A61F 13/5
U.S. Cl. 604—389 33 Claims



1. A disposable absorbent article comprising:

a body portion having an inside surface, an outside surface opposite of said inside surface, longitudinal edges, and edges, a first end region, and a second end region opposite of said first end region, said body portion comprising a liquid pervious topsheet, a liquid impervious backsheet joined to said topsheet, and an absorbent core disposed between said topsheet and said backsheet; and

a mechanical fastening system positioned on said body portion and comprising

a closure member disposed adjacent each longitudinal edge of said body portion in said first end region, each of said closure members comprising a first mechanical fastening means for forming a closure for the absorbent article, said first mechanical fastening means comprising a first fastening element;

a landing member disposed on said body portion in said second and region, said landing member comprising a second mechanical fastening means for forming a closure with said first mechanical fastening means for the absorbent article, said second mechanical fastening means comprising a second fastening element mechanically engageable with said first fastening element; and

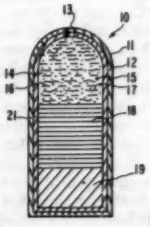
disposal means joined to the absorbent article for allowing the absosbent article to be secured in a configuration that provides convenient disposal of the absorbent article, said disposal means comprising a third mechanical fastening means for securing to said first mechanical fastening means, said third mechanical fastening means comprising a second fastening element mechanically engageable with said first fastening element.

4,963,141

DISPENSING SYSTEM FOR ADMINISTERING BENEFICIAL AGENT FORMULATION TO RUMINANTS

James B. Eckenhoff, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 151,384, Feb. 2, 1988, Pat. No. 4,865,598, which is a continuation of Ser. No. 766,235, Aug. 16, 1985, abandoned. This application Jul. 17, 1989, Ser. No. 380,044
The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.
Int. Cl.[5] A61K 9/22
U.S. Cl. 604—892.1 8 Claims



8. A dispensing device for delivering a beneficial agent formulation to an aqueous-fluid environment of use, wherein the dispensing device comprises:

(a) wall means for surrounding and forming an internal compartment, said wall comprising in at least a part a composition pervious to the passage of an aqueous fluid present in the environment of use;

(b) means in the compartment for absorbing and imbibing aqueous fluid into the compartment for expanding and occupying an increasing volume of the compartment;

(c) a beneficial agent formulation in the compartment, said beneficial agent formulation imbibing aqueous fluid into the compartment for forming with the beneficial agent a dispensable aqueous-like formulation;

(d) means in the compartment for increasing the weight of the dispensing device, said means having a density from 1 to 8 and comprising a solid unit body and positioned between the beneficial agent formulation and the means for expanding in the compartment, and wherein upon the means for expanding absorbs and imbibes aqueous fluid said means expands and pushes said means for increasing

the weight of the dispensing device against said beneficial agent aqueous formulation, whereby said beneficial agent aqueous formulation is pushed into;

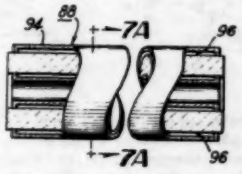
(e) passageway means in the dispensing device for delivering the beneficial agent aqueous formulation to the environment of use.

4,963,142

APPARATUS FOR ENDOLASER MICROSURGERY

Hanspeter Loertscher, 3301 S. Bear, Apt. 60C, Santa Ana, Calif. 92704

Filed Oct. 28, 1988, Ser. No. 264,438
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—14 **17 Claims**



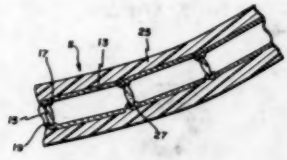
1. A probe for performing endolaser microsurgery and removing ablated tissues in which said probe is connected to a laser delivery system for delivering pulsed laser energy, said system having an optical fiber delivery means with an end surface abutting said probe for conducting said energy, said probe comprising a walled tubular member for guiding the laser energy through said walls by way of providing multiple reflections at the cylindrical surfaces of said walls and including a central canal through said tubular member for aspiration of liquids and ablated tissue debris.

4,963,143

LASER SURGICAL APPARATUS WITH A LENSGUIDE

Douglas A. Pinnow, Universal Photonics, Inc., 25401 Cabot Rd., Ste. 110, Laguna Hills, Calif. 92653

Continuation of Ser. No. 62,589, Jun. 16, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 331,751
Int. Cl.[5] A61B *17/36*
U.S. Cl. 604—14 **24 Claims**



1. A surgical apparatus comprising:

a surgical laser which emits ultraviolet or infrared radiant energy;

a lensguide for transmitting said radiant energy from said surgical laser at a point outside a patient's body to a point on the surface or inside the patient's body, said lensguide comprising a series of spaced convex lenses disposed within a plurality of rigid tubular segments, each segment being connected end to end with an adjacent segment in such a manner as to permit bending of the lensguide; and

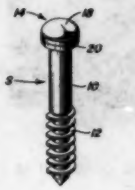
means for discharging the radiant energy from said lensguide at a point inside the patient's body for performing laser surgery.

4,963,144

BONE SCREW FIXATION ASSEMBLY, BONE SCREW THEREFOR AND METHOD OF FIXATION

Donald R. Haese, 201 N. Valeria, Fresno, Calif. 93701

Filed Mar. 17, 1989, Ser. No. 324,702
Int. Cl.[5] A61B *17/58*
U.S. Cl. 606—73 **22 Claims**



10. A fixation device, comprising:

(a) a cylindrical shank having first and second end portions;

(b) first thread means formed in said first end portion extending toward but terminating short of said second end portion;

(c) a head mounted to said second end portion, said head having an upper surface being uninterrupted and arcuate, and a side rim extending from said upper surface; and,

(d) second thread means formed about said side rim.

4,963,145

POROUS CERAMIC MATERIAL AND PROCESSES FOR PREPARING SAME

Shigehide Takagi, Narashino, and Shigeru Yamauchi, Tokyo, both of Japan, assignors to Sumitomo Cement Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 904,152, Sep. 5, 1986, abandoned, which is a division of Ser. No. 628,600, Jul. 6, 1984, Pat. No. 4,654,314. This application Mar. 20, 1989, Ser. No. 325,098
Claims priority, application Japan, Jul. 9, 1983, 58-124085; Jul. 9, 1983, 58-124087
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—76 **19 Claims**

1. A porous ceramic material comprising a sintered porous body of a calcium phosphate compound, wherein a multiplicity of capillary void paths having a diameter in the range of 1 to 30 μm and a multiplicity of pores interconnected by said capillary void paths having a diameter of 3 to 600 μm are formed in the sintered porous body and at least part of said pores are connected to the exterior space of the sintered porous body through at least a part of said capillary void paths and wherein all of the capillary void paths have substantially the same diameters and said pores are substantially spherical, and the diameters of said capillary void paths are smaller than the diameters of said pores.

4,963,146

MULTI-LAYERED, SEMI-PERMEABLE CONDUIT FOR NERVE REGENERATION

Shu-Tung Li, Oakland, N.J., assignor to Collа-Tec Incorporated, Plainsboro, N.J.

Filed Apr. 20, 1989, Ser. No. 341,572
Int. Cl.[5] A63B *17/00*
U.S. Cl. 606—152 **48 Claims**

1. A hollow conduit for promoting the in vivo regeneration of a severed mammalian nerve so as to bridge a gap between its severed ends having walls comprised of Type I collagen, said walls characterized by having at least one layer with a pore size in the range of from about 0.006 μm to about 5.0 μm which

selectively allows for the diffusion of at least neuronotrophic factors through said layer while substantially preventing the

diffusion of fibrogenic cells, and at least one substantially porous layer.

4,963,147

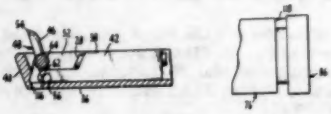
SURGICAL INSTRUMENT

John M. Agee, 3980 Bartley Dr., Sacramento, Calif. 95822, and Francis King, Shingle Springs, Calif., assignors to John M. Agee, Sacramento, Calif.

Continuation of Ser. No. 98,610, Sep. 18, 1987, abandoned. This application Jul. 14, 1989, Ser. No. 380,624

Int. Cl.[5] A61B *17/32*

U.S. Cl. 606—170 **23 Claims**



1. A surgical instrument for manipulating selected tissue in a body cavity under visual inspection, comprising:

(a) a probe having an upper surface, a generally closed distal end, and a lateral aperture in said upper surface and adjacent said closed distal end; wherein the upper surface adjacent to the lateral aperture is configured generally as a flat or concave surface; wherein said distal end slopes away from said upper surface in a manner such that said distal end diverts displaceable tissue it contacts away from the region of the lateral aperture and said upper surface;

(b) means for accepting an optical system disposed at least partially within the probe, said system having a distal portion terminating adjacent the lateral aperture, thereby defining a viewing space between the distal portion of the optical system, and the distal end and the lateral aperture, said viewing space located within the field-of-view of the optical system;

(c) a working tool mounted within the viewing space and capable of being extended from the viewing space and through the lateral aperture; and

(d) means for extending the working tool outwardly from the viewing space and through the lateral aperture;

(e) a grip handle rotatably connected to said probe; and

(f) adjustment means for adjusting the rotational orientation between said lateral aperture of said probe and said grip handle; wherein said adjustment means is adapted to temporarily fix said rotational orientation.

4,963,148

INTRAOCULAR OPTICAL SYSTEM

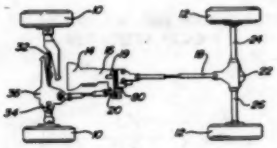
Jiří Sulc, and Krcová Zuzana, both of Prague, Czechoslovakia, assignors to Ceskoslvnska akademie ved, Prague, Czechoslovakia

Filed Mar. 31, 1989, Ser. No. 331,435

Claims priority, application Czechoslovakia, Apr. 11, 1988, 2470-88

Int. Cl.[5] A61F *2/16*

U.S. Cl. 623—6 **23 Claims**



23. An intraocular optical system adapted for insertion into a capsula lentis after removal of a natural lens, said capsula having anterior and posterior surfaces, said system comprising an elastically deformable insert whose shape follows generally the interior surfaces of the capsula, said insert being adapted for leaning against the interior surface of the capsula and keeping the capsula in a moderately tensioned state, said insert comprising a front element, a rear element, an elastic element located therebetween which contacts the periphery of said front and rear elements and biases said elements apart from one another, and at least one lens adapted for placement along the main axis of the eye and being in communication with said insert, wherein upon insertion into the capsula said front element is adapted for communicating with substantially all of the anterior surface of the capsula and said rear element is adapted for communicating with substantially all of the posterior surface of said capsula.

4,963,149

FLEXIBLE ONE-PIECE POSTERIOR CHAMBER LENS AND METHOD OF IMPLANTING THE SAME

Azix Y. Anis, 7531 N. Hampton, Lincoln, Nebr. 68506

Continuation of Ser. No. 79,509, Jul. 30, 1987, abandoned, and a continuation-in-part of Ser. No. 201,388, May 17, 1988, Pat. No. 4,880,427, which is a continuation of Ser. No. 624,232, Jun. 25, 1984, abandoned. This application Feb. 23, 1989, Ser. No. 317,069

Int. Cl.[5] A61F *2/16*

U.S. Cl. 623—6 **5 Claims**

1. An intraocular lens implant, comprising:

a flexible, substantially ring-shaped position fixation member;

a lens body having a diameter less than said position fixation member and being positioned within said position fixation member; and

connection means connecting said lens body with said position fixation member;

said position fixation member, lens body and said connection means being of one-piece construction;

said position fixation member and connection means providing a substantially 360 degrees of contact with an eye interior and having a notch formed therein which extends inwardly thereinto for receiving one end of the incision through which the implant will be inserted;

said connection means including at least one rim portion and said position fixation member being a loop member connected to said lens by said connection means;

said loop portion being located to permit compression during insertion whereby the notch and compressed loop portion reduce the size of incision needed for insertion of the lens implant into an eye.

4,963,150

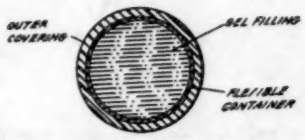
IMPLANTABLE PROSTHETIC DEVICES

Daniel Brauman, 141 Brush Hollow Cresent, Rye Brook, N.Y. 10572

Continuation of Ser. No. 12,583, Feb. 9, 1987, which is a division of Ser. No. 630,124, Aug. 30, 1984, Pat. No. 4,648,880. This application Mar. 6, 1989, Ser. No. 319,019

Int. Cl.[5] A61F *2/12*

U.S. Cl. 623—8 **4 Claims**



1. In an implantable prosthetic device for use in a human body including a flexible container and a soft gel or liquid filling the flexible container;

the improvement which comprises providing an outer plastic covering made of rough textured silicone and bonded to the flexible container, said outer plastic convering having a rough textured external surface thereby providing a multiplicity of pores and/or interstices, said outer plastic covering encases the flexible container in order to prevent the contraction of scar tissue around the prosthetic device from pulling the prosthetic device into a hard, spherical shape.

4,963,151

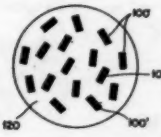
REINFORCED BONE CEMENT, METHOD OF PRODUCTION THEREOF AND REINFORCING FIBER BUNDLES THEREFOR

Paul Ducheyne, Bryn Mawr; L. D. Timmie Topoleski, Philadelphia, and John M. Cuckler, Haverford, all of Pa., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Dec. 28, 1988, Ser. No. 291,157

Int. Cl.[5] A61F *2/28*

U.S. Cl. 623—16 **29 Claims**



1. A fiber reinforcing material for incorporation into a two component bone cement including particulate polymer component and a polymerizable liquid monomer component and which reinforcing material can be readily incorporated by manual mixing into the bone cement by a surgeon during a surgical operation, said reinforcing material comprising a bundle of reinforcing fibers held together by an adhesive material which is soluble in the liquid monomer component of the two component bone cement, the fibers of said bundle having a diameter in the range of from about 5 to about 100 microns and a length in the range of from about 0.5 to about 10 millimeters, and the length-to-diameter ratio of said bundle being in the range of from about 10:1 to about 1:10.

4,963,152

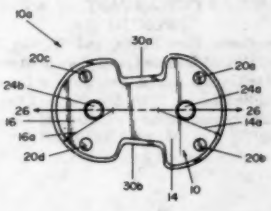
ASYMMETRIC PROSTHETIC TIBIAL COMPONENT

Aaron A. Hofmann, Salt Lake City, Utah, and Joseph S. Skraba, Austin, Tex., assignors to Intermedics Orthopedics, Inc., Austin, Tex.

Continuation of Ser. No. 923,338, Oct. 27, 1986. This application Jul. 17, 1989, Ser. No. 372,314

Int. Cl.[5] A61F *1/24*

U.S. Cl. 623—18 **7 Claims**



1. A tibial prosthesis comprising

a base having

a medial end with a first arcuate outer perimeter,

a lateral end with a second arcuate outer perimeter, said first arcuate outer perimeter having a first radius of curvature greater than a second radius of curvature associated with the second arcuate outer perimeter,

a first notch between the medial end and the lateral end, the first notch being in front of an anterior-posterior centerline, and

a second notch between the medial end and the lateral end, the second notch being behind the anterior-posterior centerline, said ends being substantially symetric with respect to said anterior-posterior centerline and said first and second notches being arranged in mirror-image relationship across said centerline;

means for securing said base to a resected surface on a patient's tibia; and

an insert having a medial condyle compartment and a lateral condyle compartment for articulating with femoral condyles, said insert being secured to an upper surface of said base.

4,963,153

METAL TIBIAL ANCHORING PART FOR A PARTIAL KNEE JOINT PROSTHESIS

Bruno Noesberger, Interlaken, and Otto Frey, Winterthur, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur and Protek AG, Berne, both of, Switzerland

Filed Jun. 10, 1988, Ser. No. 205,466

Claims priority, application Switzerland, Jun. 30, 1987, 2462/87

Int. Cl.[5] A61F *2/38*

U.S. Cl. 623—20 **20 Claims**

7. A metal tibial anchoring part for a partial knee joint prosthesis, said part including

a semi-circular bearing element defining a tibial plateau for receiving a bearing element for a femur condyle; and

a blade-like fixing element extending perpendicularly from said bearing element and having a cutting edge at a dorsal edge for penetrating into a tibia.

4,963,154

ACETABULAR CUP AS PART OF A HIP JOINT PROSTHESIS

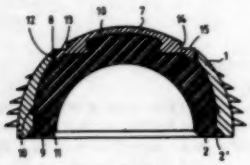
Emanuel Anapliotis; Curt Kranz, and Wiebke Ploetz, all of Berlin, Fed. Rep. of Germany, assignors to Mecron medizinische Produkte GmbH, Berlin, Fed. Rep. of Germany

Filed Jun. 6, 1989, Ser. No. 362,146

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1988, 8807481[U]; Aug. 26, 1988, 8810783[U]

Int. Cl.[5] A61F *2/32*

U.S. Cl. 623—22 **10 Claims**



1. An acetabular cup for implanting in an acetabulum, comprising:

a metal outer support ring having inner and outer surfaces, said outer surface defining part of a hemisphere, means on said outer surface defining threads for screwing said acetabular cup into an acetabulum, and means on said inner surface defining an opening;

a plastic inner socket having an inner and outer surface, said inner socket being received in said opening of said outer support ring, said outer surface of said inner socket being divided into first and second parts, only said first part of said outer surface of said inner socket being directly adjacent to and covered by said outer support ring, means on said inner socket defining an opening for receiving a joint ball of a hip joint prothesis therein; and

a covering cap adjacent said outer support ring and said inner socket, said covering cap having a metal surface and covering said second part of said outer surface of said inner socket, and said covering cap further defining the hemisphere defined in part by said outer surface of said outer support ring for thereby defining a substantially complete hemisphere.

4,963,155

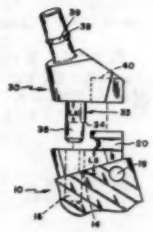
ATTACHMENT MECHANISM FOR MODULAR SURGICAL PRODUCTS

Mark A. Lazzeri; Roy Y. Hori, and James C. Harris, all of Warsaw, Ind., assignors to Zimmer, Inc., Warsaw, Ind.

Filed Aug. 30, 1989, Ser. No. 400,633

Int. Cl.[5] A61F *2/32, 5/04*

U.S. Cl. 623—23 **18 Claims**



1. A set of surgical products including a plurality of first components and a plurality of second components wherein one of the first components and one of the second components are selected for engagement with each other and wherein the first components each have a male peg extending therefrom with a key protruding from each respective peg and wherein the second components each have a female recess with a slot in each respective recess for corresponding engagement with one of the keyed pegs, and wherein the plurality of first components includes a first group of one or more first components in which the respective key is at a first orientation relative to the respective peg and a second group of one or more first components in which the respective key is at a second orientation different from the first orientation relative to the respective peg, and wherein the plurality of second components includes a first group of one or more second components in which the respective slot is at a first orientation relative to the respective recess, and a second group of one or more second components in which the respective slot is at a second orientation different from the first orientation relative to the respective recess, and wherein the first key orientation is aligned with and corresponds to the first slot orientation and the second key orientation is aligned with and corresponds to the second slot orientation, such that the first group of first components is adapted to properly align with and attach to only the first group of second components, while the second group of first components is adapted to properly align with and attach to only the second group of second components.

4,963,156

TANNING AGENT AND PROCESS

John J. Hinley, Middlesbrough, England, assignor to Tioxide Group PLC, London, England

Filed Feb. 2, 1989, Ser. No. 305,112

Claims priority, application United Kingdom, Feb. 6, 1988, 8802747

The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.

Int. Cl.[5] C14C *3/04*

U.S. Cl. 8—94.29 14 Claims

1. A leather tanning agent which comprises a mixture of metal aluminum (III) ions and metal titanium (IV) ions with an organic masking agent in which the ratio of TiO_2:Al_2O_3 on a weight basis is from 0.6:1 to 2:1 and in which the amount of the masking agent is from 0.1 to 0.4 mole per mole of total metal oxides present in the mixture, wherein said organic masking agent is a salt of a polyhydroxy monocarboxylic acid.

4,963,157

METHOD FOR BLEACHING CELLULOSIC FIBER MATERIAL WITH HYDROGEN PEROXIDE

Osamu Machida, Tokyo; Tsutomu Yoshida, Fukui; Norio Kimura, Sakai, and Masatoshi Watanabe, Adachi, all of Japan, assignors to Nippon Peroxide Co., Ltd., Tokyo and Nikka Chemical Co., Ltd., Fukui, both of, Japan

Continuation-in-part of Ser. No. 40,531, Apr. 17, 1987, abandoned. This application Nov. 22, 1988, Ser. No. 275,638

Int. Cl.[5] D06L *3/14*

U.S. Cl. 8—111 5 Claims

1. A method of bleaching a cellulosic fiber material with hydrogen peroxide, comprising:

(a) impregnating a cellulosic fiber material with an aqueous bleaching solution containing hydrogen peroxide and a stabilizer comprising:

(i) 1 to 100 parts by weight of at least one hydroxyacrylic acid polymer selected from the group consisting of poly-α-hydroxyacrylic acids, and salts thereof and polylactone corresponding thereto; and

(ii) 1 to 50 parts by weight of at least one organic phosphate acid compound selected from the group consisting of methylene 1,1-diphosphonic acid, ethylidene-1,1-diphosphonic acid, butylidene-1,1-disphosphonic acid, 1-hydroxyethylidene-1,1-diphosphonic acid, 1-hydroxypropyl-idene-1,1-diphosphonic acid, amino-tri(methylenephosphonic acid), hexamethylene diamine tetra(methylenephosphonic acid), triethylenetetramine hexa(methylenephosphonic acid), and salts of the above-mentioned organic phosphonic acids, and

(b) heating the impregnated cellulosic fiber material with steam.

4,963,158

MACHINE WASHING PROCESS FOR SOILED TEXTILE ARTICLES

Hans-Josef Beaujean, Hilden; Horst Eisenblaetter, Duesseldorf; Johann F. Fues, Grevenbroich; Brigitte Giesen, Duesseldorf-Grafenberg; Erich Holz, Duesseldorf; Ulrich Jahnke, Monheim; Werner Kuenzel, Langenfeld; Alfred Meffert, Monheim; Karl Schwadtke, Leverkusen; Eduard Smulders, Hilden; Eric Sung, Monheim; Andreas Syldatk, Duesseldorf; Hans-Georg Toelken, Duesseldorf, and Ingo Wegener, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

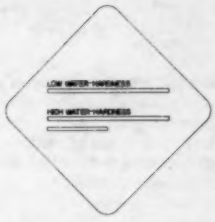
Filed Feb. 8, 1989, Ser. No. 308,171

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1988, 38037246; Jul. 15, 1988, 38239779; European Pat. Off., Nov. 10, 1988, 881187322

Int. Cl.[5] C11D *17/04*

U.S. Cl. 8—137 12 Claims

1. A process for machine washing soiled textile articles with a washing liquor containing water and wash-active surfactants comprising adding a determined amount of a detergent concentrate containing surfactants to a dosing cloth having markings therein to enable determining the quantity of said detergent concentrate to be added to the textile articles to be washed while the articles are dry or slightly damp, and forming the washing liquor by the addition of water to the textile



articles over a period of from about 5 to about 15 minutes in the amount of from about 2 to about 4 times the dry weight of said textile articles while rotating the textile articles, said detergent concentrate comprising a form-stable, paste-like or dough-like substance at room temperature.

4,963,159

HYDROPHILIC COLORED CONTACT LENS

Kenneth W. Narducy, Sunnyvale, Calif.; Richard L. Jahnke, Villa Park, and Samuel Loshaek, Chicago, both of Ill., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 124,724, Nov. 24, 1987, Pat. No. 4,857,072. This application Jul. 11, 1989, Ser. No. 377,990

The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.

Int. Cl.[5] D06P *3/52*

U.S. Cl. 8—507 12 Claims

1. A method for making a colored hydrophilic contact lens comprising the steps of:

(a) providing a contact lens constructed of hydrophilic polymer that is substantially devoid of the functional groups —COOH, —OH, —NH—R wherein R is hydrogen or C_1 to C_8 alkyl, —NCO and epoxy,

(b) coating at least a portion of a surface of the lens with a color coat comprising at least one pigment, binding polymer having functional groups selected from at least one of —COOH, —OH, and —NH—R, wherein R is hydrogen or C_1 to C_8 alkyl, and an additional compound having at least two groups per molecule of —NCO, and

(c) subjecting the coated lens to conditions which cause the color coat to adhere to the lens.

4,963,160

REACTIVE UV ABSORBING COMPOSITIONS AND METHOD OF PREPARING LENSES THEREFROM

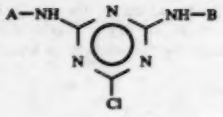
William M. Hung, and Kai C. Su, both of Alpharetta, Ga., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 14, 1989, Ser. No. 323,327

Int. Cl.[5] D06P *5/00*

U.S. Cl. 8—507 10 Claims

1. An ultraviolet radiation absorbing contact lens comprising an effective amount of an ultraviolet radiation absorbing agent bonded to a polymeric lens material, said ultraviolet radiation absorbing agent having the formula:



wherein

A is selected from the group consisting of p-aminobenzoic acid, p-aminosalicylic acid, substituted benzophenone and substituted benzotriazoles;

said polymeric lens material has a functional group selected from the group consisting of hydroxyl, amino, amide, and mercapto, and mixtures thereof.

4,963,161

NON-AQUEOUS ALKALI BATTERY HAVING AN IMPROVED CATHODE

Ignacio Chi, North Andover, Mass., and Wei-Chou Fang, Bridgewater, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 10, 1989, Ser. No. 377,504

Int. Cl.[5] H01M *6/00*

U.S. Cl. 29—623.5 **21 Claims**

1. A process of production a non-aqueous secondary cell comprising an alkali metal anode electrode, a cathode electrode with cathode active material, a separator, and an electrolyte comprising an organic solvent having an alkali metal dissolved therein, said cathode active material comprisng at least one chaloceginde material selected from the group consisting of $NbSe_2$, $NbSe_3$, NbS_3, MoS_2, TiS_2, TiS_3, $TaSe_3$, TaS_2, V_6O_{13}, CoO_2 and MoO_2, said process including the step of assembling the anode electrode, the cathode electrode, the separator and the electrolyte to form a non-aqueous secondary cell,

wherein said positive electrode is produced by bonding mats of positive electrode active material to opposite surfaces of a metal foil acting as a current collector, the metal being chemically inert under operating conditions of the cell, said bonding including coating said opposite surfaces of the metal foil with a layer of a bonding polymer, placing mats of positive electrode active material in contact with said coated surfaces of the foil so as to form a metal foil and mats composite, and compacting the composite to a desired thickness.

4,963,162

COAL GASIFICATION PROCESS

Charles V. Sternling, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 29, 1987, Ser. No. 138,766

Int. Cl.[5] C10J *3/54, 3/82*

U.S. Cl. 48—203 **2 Claims**

1. A process for the gasifiction of coal comprising

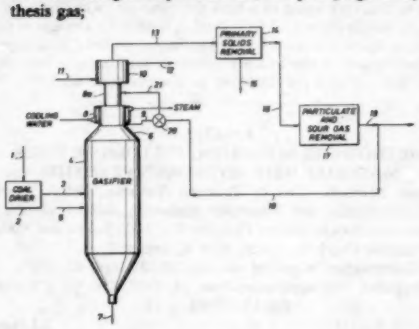
(a) oxidizing particulate coal under conditions to produce impure synthesis gas at a temperature of from about 1050° C. to about 1800° C. and containing molten flyslag;

(b) passing said synthesis gas to a quench zone having a wall or walls cooler than said synthesis gas;

(c) contacting the impure synthesis gas with a cooler quenching gas in said quench zone, and quenching said synthesis gas, flyslag depositing on the wall or walls in contact with said synthesis gas;

(d) recovering impure quenched synthesis gas from said quench zone;

(e) cooling said quenched synthesis gas in a heat exchange zone following said quench zone, and purifying said synthesis gas;



(f) reducing or stopping the flow of cooler quenching gas to said quench zone for a time sufficient to allow the temperature of deposited flyslag in the quench zone to increase and the flyslag to melt and flow from at least a portion of said wall or walls through the quench zone;

(g) passing at least a portion of said cooler quenching gas and cooling said synthesis gas with said cooler quenching gas at a locus between the quench zone and the heat exchange zone; and

(h) resuming the flow of cooler quenching gas to the quench zone as set forth in step (c).

4,963,163

DETERMINATION OF GASIFIER OUTLET AND QUENCH ZONE BLOCKAGE

Lloyd A. Cloanburg, Jr., Houston, and Otto E. Crenwelge, Jr., Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 28, 1989, Ser. No. 458,196

Int. Cl.[5] C10J *3/00, 3/46*

U.S. Cl. 48—210 **24 Claims**

1. A process for monitoring the open cross sectional area of the outlet, or a section of a quench zone or conduit proximate to and communicating with the outlet, to detect changes therein, of a gasifier operated under elevated temperature and pressure for partially oxidizing coal, while quenching synthesis gas and molten flyash particles from said gasifier and while carrying out a process for the partial oxidation of coal in the gasifier, comprising

(a) providing at least one first pressure transducer in said gasifier;

(b) providing at least one second pressure transducer at a locus in the quench zone proximate the outlet of the gasifier;

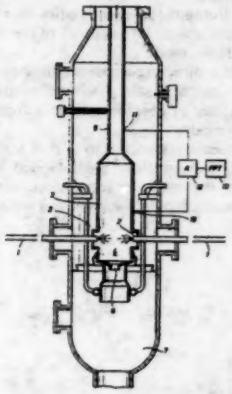
(c) concomitantly receiving sound pressure generated in said gasifier in both the at least one first pressure transducer and the at least one second pressure transducer, and transmitting from each of said transducers a time domain electrical signal proportionate to the amplitude of the sound pressure received by each of said respective transducers;

(d) converting said time domain signals respectively to

mathematically complex signals in the frequency domain proportional to their pressure magnitudes;

(e) comparing the frequency domain signal from the at least one transducer in the quench zone to the frequency domain signal from the at least one transducer in the gasifier at a pre-selected frequency, and deriving a frequency response function from the comparison;

(f) comparing the magnitude of said frequency response function with a predetermined value.



4,963,164

MACHINE FOR SURFACE TREATMENT WITH MEANS FOR POSITIONING PROCESSING TOOLS

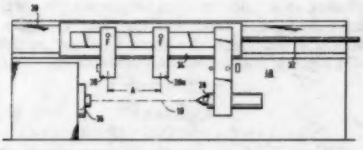
Wilfried Weber, Freudenstadt, Fed. Rep. of Germany, assignor to Maschinenbau Grieshaber GmbH & Co., Wolfach, Fed. Rep. of Germany

Filed Nov. 30, 1988, Ser. No. 278,037

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1987, 3740597

Int. Cl.[5] B24B *5/04*

U.S. Cl. 51—154 **4 Claims**



1. Machine for superfinishing rotationally symmetrical surface sections on shaft-like workpieces, preferably for treating the surfaces of bearing places on cam shafts or crankshafts with means for positioning the processing tools characterized in a plurality of processing stations (24A, 24B, 24C...) disposed parallel to each other, different shaft-like workpieces (18) which extend in a line parallel to said stations, means for conveying said workpieces to said stations, a plurality of workpiece processing means, carriage means (34) for carrying said workpiece processing means, said carriage means being adjustably mounted for movement parallel to said stations between randomly selected positions, whereby said workpiece processing means are spaced from each other and positionable with said carriage means (34) relative to said workpieces, a rotatably mounted, driven workpiece clamping means and a tailstock (26) arranged in axial alignment with said clamping means, said workpieces (18) disposed in clamped relationship between said clamping means and said tailstock, a random number of exchangeable processing tools (28) for radially gripping the surfaces of said workpieces to be processed, and said tailstock mounted on each of said carriage means (34).

4,963,165

COMPOSITE MEMBRANE, METHOD OF PREPARATION AND USE

Ingo Blume, Hengelo, Netherlands, and Ingo Pinnau, Austin, Tex., assignors to Membrane Technology & Research, Inc., Menlo Park, Calif.

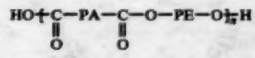
Continuation-in-part of Ser. No. 43,227, Apr. 27, 1987, abandoned. This application Oct. 31, 1988, Ser. No. 295,686

Int. Cl.[5] B01D *53/22, 61/36, 71/56*

U.S. Cl. 55—16 **30 Claims**

1. A process for separating a component of a first fluid mixture, comprising the steps of:

bringing said first fluid mixture into contact with the feed side of a separation membrane, said separation membrane comprising a composite of a microporous support membrane coated with a permselective membrane, said permselective membrane comprising a polyamide-polyether block copolymer having the formula:



wherein PA is a saturated aliphatic polyamide segment, PE is a polyether segment, and n is a positive integer, wherein said separation membrane exhibits a selectivity as measured with pure gases from carbon dioxide over hydrogen of at least 5.5; and

withdrawing from the permeate side of said separation membrane a second fluid mixture wherein the proportion of said component is enriched, compared with said first fluid mixture.

4,963,166

VAPOR PURIFICATION APPARATUS

Douglas C. Hoyt, P.O. Box 173, Suwanee, Ga. 30174, and William M. Callum, 5950 Riverwood Dr., Atlanta, Ga. 30328

Filed Jan. 2, 1990, Ser. No. 459,541

Int. Cl.[5] B01D *50/00*

U.S. Cl. 55—316 **15 Claims**

6. Apparatus for removing impurities from contaminated vapor comprising:

a vertically oriented housing containing gas adsorption media in a bed vertically arranged within said housing for removing gaseous contaminants in a vapor stream;

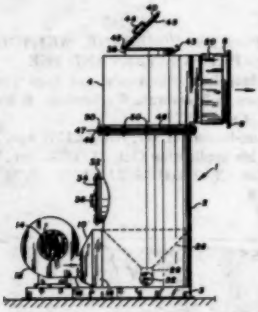
a vapor inlet near the lower end of said housing;

vapor pressurization means positioned adjacent to said inlet for directing a pressurized stream of vapor through said inlet and into the lower end of said housing, and thence upwardly through said media bed;

a head section on the upper end of said housing for receiving purified vapors from the upper end of said media bed, said head section carrying a discharge segment having a vapor outlet through which purified vapors may be discharged; and

a combined media support and vapor-diffusing member positioned in the lower end of said housing adjacent to said vapor inlet, said member being of conical shape and having perforated walls which incline upwardly and outwardly from its bottom, whereby said media bed is sup-

ported on said perforated walls of said conical member and pressurized vapor entering the lower end of said



housing is evenly distributed upwardly through said perforated walls and thence vertically upwardly through said media bed.

4,963,167

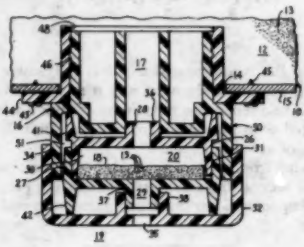
AIR DELIVERY MONITORING SYSTEMS

Peter S. Young, 9690 Calle La Cuesta, Riverside, Calif. 92503

Filed Nov. 20, 1989, Ser. No. 438,185

Int. Cl.[5] B01D *46/00*

U.S. Cl. 55—97 **20 Claims**



1. In a method of monitoring an air delivery system including an air duct for contaminants, the improvement comprising in combination the steps of:

providing an aperture in a wall of said air duct;

covering said aperture with an insert having a bore;

providing said insert with a filter element accessible from outside of said air duct;

permitting air with contaminants to escape from said air duct through said bore; and

trapping said contaminants with said filter element for subsequent laboratory analysis.

4,963,168

APPARATUS FOR RECOVERING SOLVENT FROM SOLVENT LADEN PROCESS AIR STREAMS

Robert J. Spencer, Naperville, Ill., assignor to Allied-Signal Inc., Morris Township, N.J.

Filed Jul. 21, 1989, Ser. No. 382,948

Int. Cl.[5] B01D *53/04, 19/00*

U.S. Cl. 55—180 **15 Claims**

1. Apparatus for removing solvent vapor from a process air stream, comprising:

(a) at least a first tank provided with a bed of material capable of adsorbing solvent from the process air stream flowing through it in an adsorbing mode;

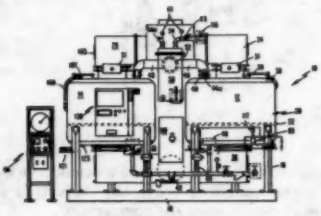
(b) inlet duct means for directing the process air into the tank at one side of the bed;

(c) outlet duct means communicating with the other side of the bed for directing process air flowing through the bed out of the tank;

(d) means for closing the inlet and outlet duct means to stop the flow of process air into and out of the tank, terminating the adsorbing mode;

(e) first means for directing a gaseous flow medium into the tank through the bed, said gaseous flow medium having the characteristic of desorbing solvent from the bed in a regenerating mode;

(f) condenser means connected to said at least first tank to receive said gaseous flow medium and solvent vapor desorbed by the medium for condensing said solvent vapor and/or medium into solvent and water condensates, respectively;



(g) separator means, connected to the condenser means through a first outlet formed in a bottom region of the condenser means where condensates collect, for receiving and storing said condensates from the condenser means; and

(h) means, connected to the condenser means through at least one outlet in the condenser means located above the bottom portion, for directing residual solvent vapor and water and condensate entrained therewith out of the condenser means and along a flow path provided with a chamber of greater cross-sectional area than the flow path, in which chamber said solvent vapor and air are separated from the entrained condensates, said chamber including an air outlet in an upper portion thereof through which the air and vapor exit the chamber, and a liquid outlet in a bottom portion thereof through which separated liquid is discharged from the chamber.

4,963,169

FUEL TANK VENTING SEPARATOR

Jeffrey H. Granville, Anacortes, Wash., assignor to Racor Division of Parker Hannifin Corp., Cleveland, Ohio

Filed Jan. 12, 1989, Ser. No. 296,446

Int. Cl.[5] B01D *19/00*

U.S. Cl. 55—185 **16 Claims**

1. A liquid storage tank venting separator for continuously venting and maintaining atmospheric pressure in the tank while preventing the overboard venting of liquid, the separator comprising:

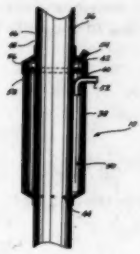
chamber means;

first means for providing unrestricted fluid communication between said chamber means and the tank to admit liquid and vapor from the tank to said chamber means and to conduct air from said chamber means to the tank, said first fluid communication means being independent of a fill tube for the tank;

second means for providing fluid communication between said chamber means and the tank that is positioned vertically below the first fluid communicating means to return liquid falling by the force of gravity from the first fluid communicating means to the tank; and,

third means for providing unrestricted fluid communication

between said chamber means and the atmosphere that is independent of said first and said second fluid communica-



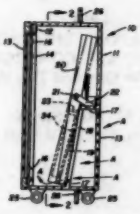
tion means and said chamber means to vent vapor from the chamber means to the atmosphere and to admit air from the atmosphere.

4,963,170

INFLOW AND OUTFLOW HEPA VENT FILTER FOR ASBESTOS WORK AREAS

John E. Weber, Oakland, and Lee C. Conrad, Burbank, both of Calif., assignors to Global Consumer Services, Inc., Burbank, Calif.

Filed Dec. 4, 1989, Ser. No. 445,352
Int. Cl.[5] B01D *46/42*
U.S. Cl. 55—311 **8 Claims**



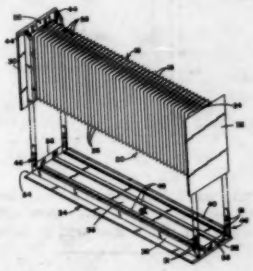
1. A HEPA vent filter device for temporary positioning in an air inlet to work area separated by walls from a clean area, said air being normally caused to flow through said device in a first direction into said work area from said clean area; said device comprising a housing having openings in front and back walls, extensible curtain walls on the exterior of said housing between said front and back walls, a HEPA filter, pivot means mounting said HEPA filter in said housing between said front and back walls, partition in said housing between said front and back walls positioned at an angle from vertical and defining a framed opening, said HEPA filter positioned for movement between a first position spaced with respect to said framed opeining in which the air passing through said housing in a first direction from said clean area to said work area bypasses said HEPA filter to a second position engaging said framed opening in which air passing through said housing from said work area to said clean area passes through said HEPA filter.

4,963,171

HIGH EFFICIENCY FILTER AND METHOD OF FABRICATING SAME

Richard J. Osendorf, W. Saint Paul, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Nov. 2, 1989, Ser. No. 430,734
Int. Cl.[5] B01D *46/10*
U.S. Cl. 55—355 **15 Claims**



1. A filter assembly comprising:

A generally rectangular pleated filter element with opposite end edges defined by the pleated edges of said element and opposite side edges defined by the generally planar side edges of said element;

a housing in which said filter is mounted, said housing having first and second pairs of oppositely disposed frame members, each of said first pair of frame members comprising a generally planar base member and a pair of upright members defining a channel for receiving one of said end edges of said filter element, means for spacing said filter element from the surface of said planar member, and a means disposed at each end of said planar member for retaining a sealant in a viscous state within said channel during assembly, each of said second pair of frame members comprising a generally planar base member and a pair of upright members defining a channel for receiving one of said side edges;

sealant means disposed within said channels for bondiag said filter element to said frame members and sealing the interface between said filter element and said frame members;

means for joining said frame members together to form a generally rectangular housing.

4,963,172

BAGGER UNIT FOR A VACUUM LOADER OR THE LIKE

Thomas DeMarco, 5815 N. Cicero Ave., Chicago, Ill. 60646

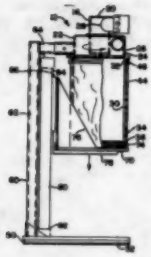
Filed Nov. 27, 1987, Ser. No. 126,186
The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.
Int. Cl.[5] B01D *45/12*
U.S. Cl. 55—429 **11 Claims**

1. A bagger unit for use with equipment for removing asbestos, hazardous material, or other particulate matter, comprising:

a vacuum operated filling member comprising a peripheral wall extending into the interior of container means for substantially filling said container means with asbestos, hazardous material, or other particulate matter under negative pressure and suction;

support means comprising means for movement between a first position wherein said support means is spaced from said filling member to facilitate the insertion of said filling member into said container means, to a second position wherein said support means is positioned substantially adjacent said filling member during at least part of the

filling for maintaining negative pressure and suction during said filling and for facilitating support of said container



means during said filling and to a third position wherein said support means is spaced away from said filling member to facilitate the removal of said container means.

4,963,173

ALDITOL ESTER DERIVATIVES OF TRICLOPYR, THEIR PREPARATION AND HERBICIDAL USE THEREOF

Nicholas Dennis, Norfolk, and Donald C. Burrell, Newbury, both of England, assignors to The Dow Chemical Company, Midland, Mich.

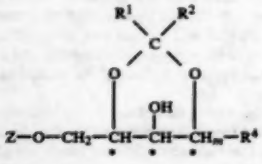
Division of Ser. No. 36,947, Apr. 10, 1987, Pat. No. 4,857,102. This application May 1, 1989, Ser. No. 345,512

Claims priority, application United Kingdom, May 28, 1986, 8612940

Int. Cl.[5] C07D 213/64, 405/12; A01N 43/40

U.S. Cl. 71—94 **21 Claims**

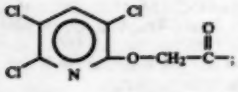
1. A compound corresponding to the general formula



(III)

wherein

Z represents

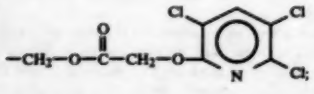


(A)

R^1 and R^2 are each independently any sterically compatible combination of H, a C_1–C_6 straight chain or branched alkyl group, a C_3–C_6 cycloalkyl group, or phenyl;

R^1 and R^2 taken together represent a divalent polymethylene group —CH_2—n, thereby forming a carbocyclic ring having n+1 carbon atoms wherein in is 3, 4, 5 or 6;

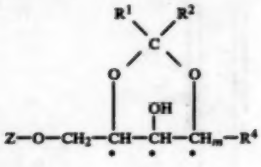
R^4 is H, CH_2OH or a group of the formula



(B)

and m is 1 or 2.

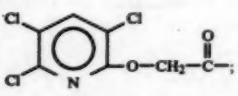
13. A method for the postemergent kill and control of weeds which comprises applying to said weeds a herbicidally effective amount of a composition containing as the active component an alditol derivative ester of triclopyr in intimate admixture with an inert carrier therefor and said active component is a compound corresponding to one of the general formula



(III)

wherein

Z represents

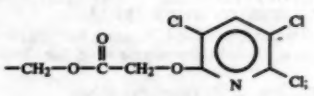


(A)

R^1 and R^2 are each independently any sterically compatible combination of H, a C_1–C_6 straight chain or branched alkyl group, a C_3–C_6 cycloalkyl group, or phenyl;

R^1 and R^2 taken together represent a divalent polymethylene group —CH_2—n, thereby forming a carbocyclic ring having n+1 carbon atoms wherein n is 3, 4, 5 or 6;

R^4 is H, CH_2OH or a group of the formula:



(B)

and m is 1 or 2.

4,963,174

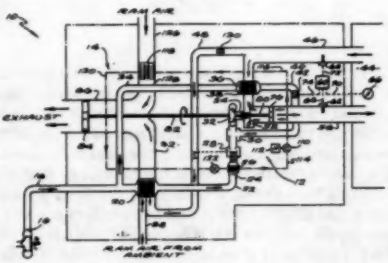
HYBRID VAPOR CYCLE/AIR CYCLE ENVIRONMENTAL CONTROL SYSTEM

George K. Payne, 28416 Quailhill Dr., Rancho Palos Verdes, Calif. 90274

Filed Dec. 12, 1989, Ser. No. 450,348

Int. Cl.[5] F25B 9/06

U.S. Cl. 62—87 **15 Claims**



1. An environmental control system to provide a flow of pressurized, conditioned air to an enclosed space, comprising:

means for providing a flow of hot, high pressure air;

means for cooling at least a portion of said pressurized air flow in air to air heat exchange relationship;

vapor cycle means for cooling said same portion of said pressurized air flow in heat transfer relationship with a refrigerant gas within said vapor cycle means;

bypass duct means for diverting any remainder of said pressurized air flow from upstream of said means for cooling to downstream of said vapor cycle means for cooling;

expansion turbine means for expanding said pressurized air flow while extracting useful work therefrom, said expansion of said air flow reducing the temperature thereof;

fresh air duct means for distributing said expanded cooled air from said turbine means to said enclosed space;

recirculation duct means for recirculating air from said enclosed space to a location within said fresh air duct means proximate said turbine means; and

controller means for controlling the amount of pressurized air diverted through said bypass duct means and the temperature of the air flow delivered to said enclosed space.

4,963,175

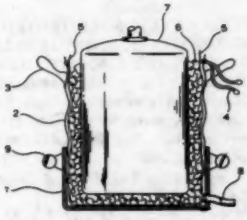
KEG COOLER TUB

Donald E. Pace, 746 Peine, Wentzville, Mo. 63385

Filed Oct. 10, 1989, Ser. No. 419,547

Int. Cl.[5] F25D *3/08*

U.S. Cl. 62—372 **1 Claim**



1. A transportable beverage keg container providing space for coolant material between a plastic liner and the enclosed keg wherein the improvement comprises:

(a), a sturdy circular tub-like base having a canvas sleeve extending upwards from the top circular edge of the base;

(b), the top edge of the sleeve having draw string means for securing the sleeve to the enclosed keg;

(c), a conventional plastic trash bag used as a water proof liner for the sleeve enclosure;

(d), radial spacing provided between the keg trash bag liner interface for introducing ice or coolant material;

(e), an orifice on the bottom outside perimeter of the base unit for draining the liner enclosure;

(f), rigid handles or the outer surface each side of the base; and,

(g), fabric handles the outer surface each side of the canvas sleeve.

4,963,176

METHOD FOR MAKING GLASS FIBER MATS USING CONTROLLABLE FIBER GLASS STRAND FEEDERS

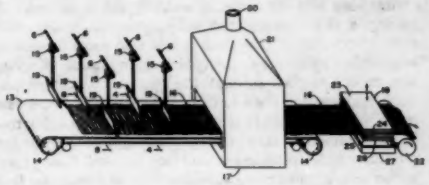
Paul E. Bailey, and Shahid Rauf, both of Shelby, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 6, 1989, Ser. No. 418,058

Int. Cl.[5] C03B *37/02*

U.S. Cl. 65—4.4 **27 Claims**

1. In a method for making a mat of continuous fiber strands by traversing at least one strand feeder back and forth across the surface of a moving conveyor, said strand feeder advancing at least one strand from a supply source and depositing it onto the surface of said conveyor, the improvement comprising: sensing the relative position of said strand feeder with respect to its location across the width of said moving conveyor; by detecting a signal emitted by at least one sensor in response to the momentary juxtaposition of said feeder and sensor with one another whereby the frequency and voltage supplied to a rotating electric motor is altered thereby causing



said motor to rotate at a different speed and deposit strand at a different rate from said feeder so as to form a mat having substantially uniform thickness and density.

4,963,177

METHOD FOR MAKING A GRATING ASSISTED OPTICAL WAVEGUIDE DEVICE

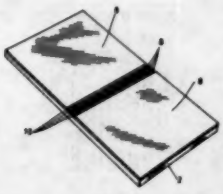
Seyed-Iraj Najafi, Dollard des Ormeaux; Kenneth O. Hill, Kanata; Francois Bilodeau, and Derwyn C. Johnson, both of Nepean, all of Canada, assignors to Canadian Patents and Development Limited/Societe Canadienne des Brevets et d'Exploitation Limitee, Ottawa, Canada

Filed Jun. 15, 1989, Ser. No. 366,445

Claims priority, application Canada, Aug. 24, 1988, 575573

Int. Cl.[5] C03C *21/00*

U.S. Cl. 65—30.13 **9 Claims**



1. A method for making a grating assisted optical waveguide device, comprising the steps of:

(a) cleaning a substrate made of glass having exchangeable cations by means of cleaning agents;

(b) depositing a first layer made of metal onto a selected surface of said substrate by an evaporation process;

(c) forming a first mask by making openings in said first layer to expose first parts of said surface in a pattern for forming waveguides, said first mask being formed by a photolithographic process;

(d) immersing said substrate in a first bath of molten salt having a first preselected temperature to form waveguides by increasing the refractive index of glass immediately below said first parts of said surface by an ion-exchange in which refractive index increasing cations enter the glass through said openings in the first mask and replace said exchangeable cations;

(e) withdrawing said substrate from said first bath and then removing said first mask from said selected surface;

(f) immersing said substrate in a second bath of molten salt having a second preselected temperature and being a source of ions which will provide the same refractive index as the overall refractive index of the substrate to bury the waveguides by diffusion of cations away from said selected surface of said substrate;

(g) withdrawing said substrate from said second bath and then depositing a second layer made of metal on said surface of said substrate by an evaporation process;

(h) forming a second mask by making openings in said second layer to expose second parts of said surface in a pattern for forming a grating, said second mask being formed by a photolithographic process;

(i) immersing said substrate in a third bath a molten salt having a third preselected temperature to change the refractive index of said glass below said second parts of said surface by an ion-exchange in which grating effecting ions enter the glass through the openings in the second mask and replace both said exchangeable ions and said index increasing ions in said glass substrate, the refractive index obtained in said step (i) being different from the refractive index obtained in said step (d), said third preselected temperature being sufficiently lower than said first preselected temperature such that diffusion of said index increasing ions in the glass does not occur; and

(j) withdrawing said substrate from said third bath and then removing said second mask from said surface to obtain said grating assisted optical waveguide device.

4,963,178

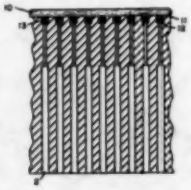
APPARATUS FOR MAKING QUARTZ GLASS CRUCIBLES

David R. Brown, Beverly, Mass.; Charles E. Frost, Jr., Exeter, and Kenneth A. White, Raymond, both of N.H., assignors to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 87,118, Aug. 19, 1987, which is a division of Ser. No. 846,190, Mar. 3, 1986, Pat. No. 4,713,104. This application Oct. 2, 1989, Ser. No. 416,253

Int. Cl.[5] C03B *19/04, 19/06*

U.S. Cl. 65—144 **5 Claims**



1. Apparatus for the manufacture of quartz glass crucibles from granular quartz particles comprising:

a base having an upper flat surface, the base having holes through it and through which holes a vacuum can be drawn, the diameters of the holes at said upper surface being greater than can be bridged by the granular quartz particles, the holes at said upper surface each being filled with a plug of porous material through which a vacuum can be drawn but through which the granular quartz particles will not pass;

an open-ended cylindrical mold resting on said upper surface of the base at one of the mold's open ends, the mold and the upper flat surface of the base together providing a shaping surface that will form a crucible having a substantially flat bottom;

means for rotating the mold and base;

means for drawing a vacuum through the holes in the base, the vacuum means being capable of retaining granular quartz particles on the upper flat surface of the base during rotation of the base

the number of holes being sufficient to retain quartz particles on the full extent of the flat surface of the base during said rotation;

and means for heating the granular quartz particles, while maintaining the rotation and vacuum, to melt and fuse an inner portion of the thick layer of granular quartz particles to form a quartz glass crucible shape having a substantially flat bottom;

the apparatus including the provision that holes are provided only in the base and not in the cylindrical mold and that enough vacuum can be drawn through said holes to remove bubbles from the entire mass of the quartz particles.

4,963,179

PRESERVATIVES CONTAINING β-BROMO-β-NITROSTYRENE FOR USE IN AQUEOUS SYSTEMS

Kenneth L. Purzycki, Lake Parsippany, and Joseph A. Virgilio, Wayne, both of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed Sep. 14, 1988, Ser. No. 244,773

Int. Cl.[5] A01N *25/10, 25/12, 29/10*

U.S. Cl. 71—67 **6 Claims**

1. An antimicrobial composition which comprises an effective amount of β-bromo-β-nitrostyrene absorbed on a partially hydrolyzed starch with a DE value of 20 or less.

5. A process for combatting spoilage caused by the action of microorganisms in aqueous emulsion compositions normally subject to such spoilage, which comprises inhibiting said organism in such compositions with an effective inhibiting amount of a composition which comprises β-bromo-β-nitrosytrene absorbed on a partially hydrolyzed starch with a DE value of 20 or less.

4,963,180

HETEROCYCLIC-SUBSTITUTED PHENYLSULFAMATES, AND THEIR USE AS HERBICIDES AND PLANT GROWTH REGULATORS

Lothar Willms, Hillscheid; Heinz Kehne, Hofheim am Taunus; Klaus Bauer, Hanau, and Hermann Bieringer, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

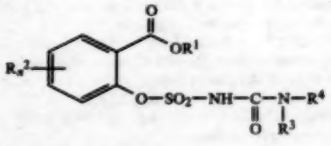
Filed Aug. 3, 1988, Ser. No. 228,000

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1987, 3725939; Feb. 27, 1988, 3806323

Int. Cl.[5] A01N *43/54;* **C07D** *239/69, 239/42, 239/50*

U.S. Cl. 71—92 **16 Claims**

1. A compound of formula I



(I)

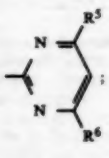
or a salt thereof wherein:

R^1 is $(C_1–C_8)$-alkyl which is monosubstituted or polysubstituted by halogen or monosubstituted or disubstituted by $(C_1–C_4)$-alkoxy, or is $(C_2–C_8)$-alkenyl or $(C_2–C_8)$-alkynyl both of which are unsubstituted, monosubstituted or polysubstituted by halogen or are monosubstituted or disubstituted by $(C_1–C_4)$-alkoxy;

R^2 is, independently of the other R^2 substituents when $n>1$, halogen or nitro, or is $(C_1–C_4)$-alkyl or $(C_1–C_4)$-alkoxy both of which are unsubstituted, monosubstituted or polysubstituted by halogen excluding R^2 is 3—OCF_2H;

R^3 is hydrogen, $(C_1–C_8)$-alkyl, $(C_2–C_8)$-alkenyl or $(C_2–C_8)$-alkynyl;

R^4 is a heterocyclic radical of formula



n is 0, 1, 2 or 3;

R^5 and R^6, independently of one another, are hydrogen or halogen, or are (C_1–C_4)-alkyl or (C_1–C_4)-alkoxy both of which are unsubstituted, monosubstituted or polysubstituted by halogen or are di-(C_1–C_4)-alkoxy-(C_1–C_2)-alkyl, cyclopropyl, —OCHR^{8}COOR^9, —NR^{9}R^{10} or (C_1–C_4)-alkythio;

R^7 is (C_1–C_4)-alkyl;

R^8 is hydrogen or (C_1–C_4)-alkyl; and

R^9 and R^{10}, independently of one another, are hydrogen, C_1–C_4)-alkyl, (C_2–C_4)-alkenyl or (C_2–C_4)-alkynyl.

13. A herbicidal composition containing a herbicidally effective amount of a compound of formula I or salt thereof as claimed in claim 1 and a suitable inert carrier therefor.

4,963,181

FUNGICIDAL 3-CYANO-4-PHENYL-PYRROLE DERIVATIVES

Detlef Wollweber, Wuppertal; Wilhelm Brandes, Leichlingen, and Stefan Dutzmann, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

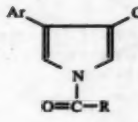
Filed Apr. 12, 1989, Ser. No. 337,195

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1988, 3814479

Int. Cl.^{5} C07D *207/44*

U.S. Cl. 71—95 **9 Claims**

1. A 3-cyano-4-phenyl-pyrrole of the formula



(I)

in which

Ar stands for phenyl which is trisubstituted by halogen, at least one of which is fluorine, and

R stands for in each case straight-chain or branched alkyl, alkoxy or alkoxyalkyl each having 1 to 6 carbon atoms in the individual alkyl moieties.

4,963,182

CONTINUOUS FEED SHAFT RETORT PROCESS FOR RECOVERY OF NON-FERROUS METALS FROM PROCESS DUST

Norman G. Bishop, Ruidoso, N. Mex.; N. Edward Bottinelli, Dallas, Tex., and Norman L. Kotraba, Tega Cay, S.C., assignors to Zia Technology, Inc., Dallas, Tex.

Filed Mar. 14, 1989, Ser. No. 323,297

Int. Cl.^{5} C21B *7/02*

U.S. Cl. 75—590 **13 Claims**

1. A method for recovering primary metals from pyrometallurgical process dust comprising:

blending said dust with solid carbonaceous material and a binder, and pelletizing the blended materials to form greenball pellets;

charging a vertical shaft retort with said greenball pellets and causing them to move continuously downwardly through said retort, said retort having an upper preheating and coking zone, an intermediate transition zone, and a lower reduction and vaporization zone;

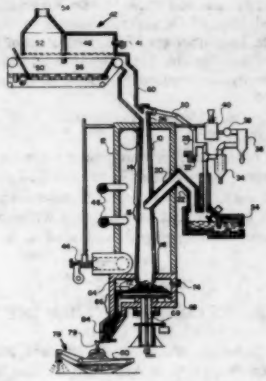
providing heat to the interior of said retort by heating the exterior thereof;

prereducing the greenball pellets in the preheating and coking zone, and releasing water vapor, gases, and volatiles from the pellets;

removing the released water vapor, gases, and volatiles from the upper portion of the upper preheating and coking zone;

reducing the pellets and vaporizing reduced metals therein in the lower reduction and vaporization zone;

removing the vaporized metals from the interior of the retort at the transition zone between the upper and lower zones; and



discharging the reduced pellets from the bottom of the retort.

4,963,183

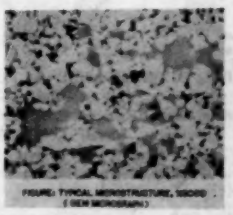
CORROSION RESISTANT CEMENTED CARBIDE

Joonypyo Hong, Rochester Hills, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Mar. 3, 1989, Ser. No. 318,865

Int. Cl.^{5} C22C *29/02*

U.S. Cl. 75—241 **11 Claims**



1. A corrosion resistant cemented carbide composite comprising a granular tungsten carbide phase, a semi-continuous solid solution carbide phase extending closely adjacent at least a portion of said grains of tungsten carbide for enhancing corrosion resistance, and a substantially continuous metal binder phase, said cemented carbide composite consisting essentially of an effective amount of an anti-corrosion additive, from about 4 to about 16 percent by weight metal binder phase, and with the remaining portion being from about 84 to about 96 percent by weight metal carbide wherein said metal carbide consists essentially of from about 4 to about 30 percent by weight of a transition metal carbide or mixtures thereof selected from Group IVB and Group VB of the Periodic Table of Elements and from about 70 to about 96 percent tungsten carbide, said metal binder phase consists essentially of nickel and from about 10 to about 25 percent by weight chromium, said effective amount of an anti-corrosion additive being selected from the group consisting essentially of copper, silver, tin and combinations thereof.

4,963,184

TOOTH FILLING MATERIAL AND METHOD OF ITS PREPARATION

Walter Diehl, Hanau, and Hans-Martin Ringelstein, Frankfurt, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 13, 1989, Ser. No. 365,294

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1988, 3820970

Int. Cl.[5] C22C *29/14*; B22F *5/00*

U.S. Cl. 75—247 8 Claims

1. A tooth filling material comprising a porous sintered gold compact adapted to be placed in cavities and solidified under the action of ultrasound, formed of platelet-shaped gold powder prepared by chemical precipitation without compressive prepressing and exhibits a pore volume of 80 to 90%.

4,963,185

AGGLOMERATES CONTAINING OLIVINE FOR USE IN BLAST FURNACE

Frank H. Ellenbaum, Willowbrook, Ill., and Richard Ciesco, Griffith, Ind., assignors to Applied Industrial Materials Corporation, Mundelein, Ill.

Division of Ser. No. 329,777, Dec. 11, 1981, abandoned, which is a division of Ser. No. 90,538, Nov. 2, 1979, abandoned, which is a division of Ser. No. 652,549, Jan. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 493,696, Aug. 1, 1974, Pat. No. 3,966,456. This application May 17, 1985, Ser. No. 735,349

Int. Cl.[5] C21B *3/02*

U.S. Cl. 75—323 6 Claims

1. An improved iron oxide-containing pellet, said pellet produced by mixing finely divided iron oxide-containing material with finely divided olivine, said iron oxide-containing material having an iron content of above 50 weight percent and containing silica gangue; forming said iron oxide and olivine mixture into green pellets; and heating said green pellets to about 2200° to 2500° F. so as to bond said iron oxide and olivine mixture together in said pellet, said olivine being introduced into said mixture in an amount between 0.1 and 15.0 weight percent based on the weight of said pellet.

4,963,186

METHOD FOR OPERATING BLAST FURNACE BY ADDING SOLID REDUCING AGENT

Masataka Shimizu, Kobe; Ryuichi Hori, Kakogawa; Yoshio Kimura, Akashi; Fumio Noma, Kobe; Mitsutoshi Isobe, Kakogawa; Tsunao Kamijo, Kobe, and Shinichi Inaba, Kakogawa, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Hyogo, Japan

Filed Sep. 2, 1988, Ser. No. 239,655

Claims priority, application Japan, Sep. 3, 1988, 62-220981; Sep. 3, 1988, 62-220982; Sep. 3, 1988, 62-220983; Sep. 3, 1988, 62-220985

Int. Cl.[5] C21B *5/00*

U.S. Cl. 75—378 5 Claims

1. In a process for operating a blast furnace wherein charges of solid reducing agent and ore are repeatedly added to said furnace through an opening in the top of said furnace, the furnace having a central axis extending through said opening to the hearth of said furnace, the improvement comprising:

adding said solid reducing agent such that the portion of the solid reducing agent added through an area defined by a circle having the central axis as its center and a radius of 0.03 times the radius of said opening (said portion being termed the central charge), is greater than 0.2% (by weight) of the total solid reducing agent added at any one charging step.

4,963,187

METALLIZING PASTE FOR CIRCUIT BOARD HAVING LOW THERMAL EXPANSION COEFFICIENT

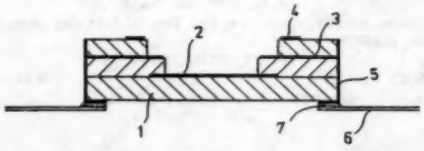
Kazuo Kondo, Nagoya, and Asao Morikawa, Komaki, both of Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Mar. 4, 1988, Ser. No. 164,361

Claims priority, application Japan, Mar. 4, 1987, 62-47439; Mar. 4, 1987, 62-47440

Int. Cl.[5] B22F *7/00*

U.S. Cl. 106—1.14 33 Claims



1. Metallizing paste consisting essentially of 100 parts of Pt, 0.5 to 5 parts of Ag, 0.1 to 1 part of CuO, and 2 to 10 parts of a low thermal expansion frit, all being by weight.

4,963,188

NOVEL WATER-BASED INK COMPOSITION

David W. Parker, Holland, Pa., assignor to Union Camp Corporation, Wayne, N.J.

Filed Sep. 30, 1988, Ser. No. 252,629

Int. Cl.[5] C09D *11/02*

U.S. Cl. 106—20 21 Claims

1. An ink composition comprising a coloring agent and a resin vehicle which comprises an aqueous solution of a resin acid-maleic anhydride polymer, said polymer being produced by the copolymerization of maleic anhydride reactive resin acids present in rosin, or esters thereof, and maleic anhydride, in the presence of a free-radical initiator, said polymer having a peak molecular weight of at least about 1500 as measured by gel permeation chromatography with retention times references to polystyrene of known molecular weights.

4,963,189

WATERFAST INK FORMULATIONS WITH A NOVEL SERIES OF ANIONIC DYES CONTAINING TWO OR MORE CARBOXYL GROUPS

Suraj L. Hindagolla, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

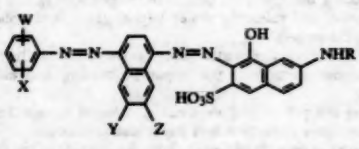
Filed Aug. 24, 1989, Ser. No. 398,018

Int. Cl.[5] C09D *11/02*

U.S. Cl. 106—22 17 Claims

1. An ink comprising, by wt%:

(a) from about 0.5% to about 20% dye which, in the free acid state, corresponds to the formula



I

wherein

W is COOH,

X is H or COOH,

Y is H, COOH, or SO_3H,

Z is H, COOH, or SO_3H, and

R is H, CH_2COOH, or CH_2CH_2COOH;

provided that there are at least two COOH groups and that the number of COOH groups is equal to or greater than the number of SO_3 groups,

(b) up to about 30% of a water soluble organic solvent for said dye, and

(c) water.

4,963,190

DISPERSANT COMPOSITION FOR CEMENT

Tatsuya Mizunuma; Ryoichi Tamaki; Shoji Kanzaki; Yoshiaki Tanisho, and Fuzio Yamato, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Mar. 17, 1989, Ser. No. 325,382

Claims priority, application Japan, Apr. 20, 1988, 63-97501

Int. Cl.[5] C04B *24/28, 22/06, 24/04*

U.S. Cl. 106—724 10 Claims

1. An aqueous dispersant composition for cement consisting essentially of 100 parts by weight of a copolymer of an olefin having 2 to 8 carbon atoms and an ethylenically unsaturated dicarboxylic anhydride, the copolymer being in the form of fine particles having an average size of from 0.1 to 20 microns, 15 to 300 parts by weight of zinc, the zinc being in the form of a compound selected from the group consisting of zinc oxide and zinc hydroxide, and water, the composition having a pH of from 6 to 12.

4,963,191

CEMENTING COMPOSITIONS

Joseph R. LaFleur, Byron Center, Mich., assignor to Solid Flue Chimney Systems, Inc., Byron Center, Mich.

Filed Aug. 16, 1989, Ser. No. 395,256

Int. Cl.[5] C04B *14/14, 14/20, 14/16, 14/18*

U.S. Cl. 106—698 15 Claims

1. A dry high temperature refractory mix consisting essentially of from 65 to 70 weight percent of portland cement, from 21 to 25 weight percent of volcanic glass, from 6 to 10 weight percent of microsilica, from 0.05 to 0.12 weight percent of least one air entraining agent and from 0.5 to 1.0 weight percent of at least one plasticizer compound.

4,963,192

PROCESS FOR THE PRODUCTION OF A PIGMENT-BASED AGENT SUITABLE FOR THE PAPER AND BOARD INDUSTRY AND IMPROVING THE PRINTABILITY OF PAPER AND BOARD

Guido Dessauer, Tutzing, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 27, 1988, Ser. No. 148,989

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1987, 3703957

Int. Cl.[5] C09C *3/00*; C09D *17/00*

U.S. Cl. 106—499 8 Claims

1. A process for the production of an agent for improving the printability of paper and board, said agent being suitable for the paper and board industry, said process comprising:

sequentially prepared an aqueous colloidal system from at least one pigment and at least one water-soluble or water-swellable, hydrated cation-exchangeable, film-forming smectic phyllosilicate having an ion exchange capacity of 50 to 120 meg/100 g and

subjecting said system to coacervation by means of a quaternary organic ammonium salt, thereby providing a coacervated product.

4,963,193

OXO-IONYL ESTERS USEFUL AS TOBACCO FLAVORANTS AND TOBACCO PRODUCTS CONTAINING SAME

Roman Kaiser, Uster, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Filed Sep. 16, 1985, Ser. No. 776,555

Claims priority, application Switzerland, Sep. 21, 1984, 4523/84

Int. Cl.[5] A24B *3/12, 15/32*

U.S. Cl. 131—276 18 Claims

1. A method for improving, enhancing or modifying the organoleptic properties of a tobacco product which comprises adding thereto an effective amount of a compound of the formula

I

wherein:

RCO represents an acyl group containing from one to eighteen carbon atoms,

the dotted line in the side-chain represents an optional bond,

one of the dotted lines in the ring represents an additional bond, and,

Z represents an oxo group which is in the position α to the double bond in the ring.

4,963,194

ADJUSTABLE DEPTH THERMOCOUPLE SYSTEM AND FITTING

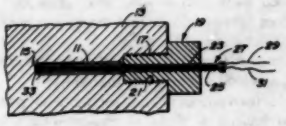
Sam Mele, 1610 Kenwood Dr., Bethlehem, Pa. 18017

Continuation-in-part of Ser. No. 2,111, Jan. 12, 1987, Pat. No. 4,826,540. This application May 1, 1989, Ser. No. 345,412

The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.

Int. Cl.[5] H01L *35/02*

U.S. Cl. 136—221 4 Claims



1. An improved mounting fitting for facilitating longitudinal adjustment of a thermocouple in a variable temperature environment comprising a unitary hollow bushing-type thermocouple fitting including:

(a) external threads at one end of said fitting arranged and constructed for interengagement with threads at the entrance to a temperature detection orifice in a machine,

(b) substantially continuous internal threads extending at least partially through the hollow interior of said fitting, said threads being arranged and constructed for interengagement securely with a flexible matching spiral resilient covering adapted for containment of a thermocouple, the contour of the internal threads of the fitting being arranged and constructed such that a close interfitting with the contour of the outer surface of the flexible spiral resilient covering is obtained,

(c) said external and internal threads having the same thread direction whereby effective seating and maintenance of a

thermocouple against the bottom wall of a temperature detection orifice is facilitated.

4,963,195

ELECTRIC RESISTOR AND A POWER DETECTOR BOTH COMPRISING A THIN FILM CONDUCTOR

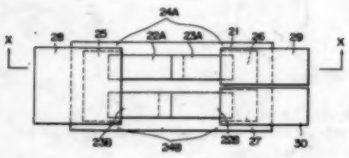
Setsuo Kodato, Atsugi, and Masao Nakamura, Hatano, both of Japan, assignors to Anritsu Corporation, Tokyo, Japan

Filed Jun. 20, 1988, Ser. No. 216,909

Claims priority, application Japan, Oct. 24, 1986, 61-253412; Oct. 27, 1986, 61-253686; PCT Int'l Appl., Oct. 23, 1987, PCT/JP87/00812

Int. Cl.[5] H01L *35/28*

U.S. Cl. 136—225 **8 Claims**



1. A power detector having a thin film conductor comprising:

an insulating substrate;

at least first and second thermocouples provided substantially in parallel on said insulating substrate, each thermocouple comprising a conductor film connected to an alloy film, said alloy film essentially consisting of silicon and germanium, in which amorphous and microcrystal phases coexist;

the alloy film of said first thermocouple and the conductor film of said second thermocouple being located on the same side of said substrate, and the alloy film of said second thermocouple and the conductor film of said first thermocouple being located on another side of said substrate;

each of said alloy film of said first thermocouple and said conductor film of said second thermocouple having a first electrode connected thereon;

said conductor film of said first thermocouple having a second electrode connected thereon;

said conductor film with said second electrode connected thereon having a third electrode which is connected thereto;

a first beam lead electrode connected to said first electrode;

a second beam lead electrode connected to said second electrode; and

a third beam lead electrode connected to said third electrode.

4,963,196

ORGANIC SOLAR CELL

Yuichi Hashimoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

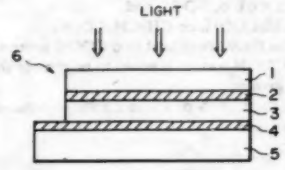
Filed Feb. 10, 1989, Ser. No. 308,636

Claims priority, application Japan, Feb. 18, 1988, 63-33997

Int. Cl.[5] H01L *31/06*

U.S. Cl. 136—257.000 **5 Claims**

1. An organic solar cell, comprising an organic photoconductive layer comprising a charge generating substance and a charge transporting substance, and a protective layer covering



the organic photoconductive layer and blocking low-wavelength light of below 450 nm.

4,963,197

GRAIN ORIENTED ELECTROMAGNETIC STEEL SHEETS HAVING A VERY LOW IRON LOSS AND METHOD OF PRODUCING THE SAME

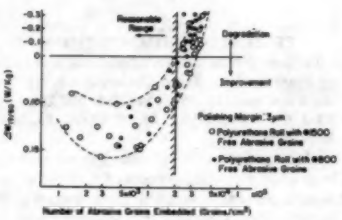
Ujihiro Nishilke; Yasuhiro Kobayashi; Hirotake Ishitobi; Shigeko Sujita; Norio Takahashi; Hisanao Nakahara, and Yukio Inokuti, all of Chiba, Japan, assignors to Kawasaki Steel Corp.

Division of Ser. No. 225,546, Jul. 28, 1988, Pat. No. 4,906,530. This application Jul. 17, 1989, Ser. No. 380,991

Claims priority, application Japan, Aug. 1, 1987, 62-191520; Aug. 1, 1987, 62-191521

Int. Cl.[5] H01F *1/04*

U.S. Cl. 148—111 **7 Claims**



1. A method of producing a grain oriented electromagnetic steel sheet having a very low iron loss by polishing a surface of base metal in said steel sheet after finishing annealing to have a center-line average roughness of not more than 0.3 μm, characterized in that said polishing employing an elastomeric polishing member using free abrasive grains or containing free abrasive grains, thereby is a mechanical polishing of giving a slight strain to said base metal surface.

4,963,198

COMPOSITION AND PROCESS FOR TREATING METAL SURFACES

George L. Higgins, Windsor, Great Britain, assignor to Brent Chemicals International plc, United Kingdom

Filed Feb. 7, 1989, Ser. No. 307,730

Claims priority, application United Kingdom, Feb. 8, 1988, 8802788

Int. Cl.[5] C23C *22/60*

U.S. Cl. 148—267 **13 Claims**

1. An aqueous alkaline solution suitable for forming a protective coating on zinc, aluminum, and alloys thereof, comprising:

(a) dissolved hexavlent chromium in an amount in the range 8–75 ppm

(b) a dissolved complexing agent for trivalent chromium ions; and

(c) dissolved trivalent chromium in an amount in the range 20–700 ppm,

said solution having a pH above 12.

4,963,199

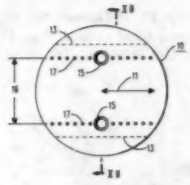
DRILLING OF STEEL SHEET

Norman M. Pavlik, Wilkinsburg; John Sefko, Monroeville, and Richard A. Miller, N. Huntingdon, all of Pa., assignors to ABB Power T&D Company, Inc., Blue Bell, Pa.

Filed Oct. 14, 1988, Ser. No. 257,915

Int. Cl.[5] H01F *1/12*

U.S. Cl. 148—307 8 Claims



1. A silicon-steel sheet having a stress-relief annealed, oriented structure with a plurality of magnetic domains, the improvement wherein said steel sheet has a plurality of closely spaced, small holes through the entire thickness of the steel sheet, said holes being effective to propagate additional domain walls and subdivide the magnetic domains.

4,963,200

DISPERSION STRENGTHENED FERRITIC STEEL FOR HIGH TEMPERATURE STRUCTURAL USE

Takanari Okuda; Shigeo Nomura; Itaru Shibahara; Yuji Enokido, all of Mito; Masayuki Fujiwara; Toshio Nishida; Hiroshi Teranishi, all of Kobe; Susumu Hirano, Amagasaki; Aturou Iseda, and Motoharu Nakajima, both of Nishinomiya, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo; Kobe Steel, Ltd., Hyogo and Sumitomo Metal Industries, Ltd., Osaka, all of, Japan

Filed Apr. 11, 1989, Ser. No. 338,932

Claims priority, application Japan, Apr. 25, 1988, 63-102298; May 11, 1988, 63-114060

Int. Cl.[5] C22C *38/22*

U.S. Cl. 148—325 4 Claims

1. A dispersion strengthened ferritic steel having excellent ductility and toughness, which has been heat treated to produce a matrix having a tempered martensitic structure comprising 0.05 to 0.25% by weight of carbon, 0.1 % by weight or less of silicon, 0.1% by weight or less of manganese, 8 to 12% by weight of chromium, 0.1 to 4.0 % by weight in total of molybdenum and tungsten, and 0.02% by weight or less of oxygen with the balance being iron and inevitable impurities and, homogeneously dispersed in said matrix, composite oxide particles comprising Y_2O_3 and at least one of TiO_2, Al_2O_3, ZrO_2 and MgO in an amount of 0.1 to 1.0% by weight in total inclusive of Y_2O_3 and the molar ratio of the total of said at least one of TiO_2, Al_2O_3, ZrO_2 and MgO is 0.5 to 2.0 relative to Y_2O_3.

4,963,201

PRIMER COMPOSITION

Robert K. Bjerke; James P. Ward, both of Lewiston, Id.; Delbert O. Ells, Clarkston, Wash., and Kenneth P. Kees, Lewiston, Id., assignors to Blount, Inc., Montgomery, Ala.

Filed Jan. 10, 1990, Ser. No. 463,234

Int. Cl.[5] C06B *45/00*

U.S. Cl. 149—2 11 Claims

1. A primer composition comprising:

a percussion-sensitive explosive selected from the class consisting of diazodinitrophenol and potassium dinitrobenzofuroxane;

a secondary explosive comprising tetracene;

a nitrate ester fuel; and

strontium nitrate.

4,963,202

PROCESS FOR THE MANUFACTURE OF CHARGES OF A SOLID COMPOSITION GENERATING NONTOXIC GASES AND CHARGES THUS OBTAINED

Christian Perotto, Ballancourt, France, assignor to S.N.C. Livbag, Bouchet, France

Filed Apr. 4, 1990, Ser. No. 504,258

Claims priority, application France, Apr. 17, 1989, 89 05032

Int. Cl.[5] G06B *35/00*

U.S. Cl. 149—35 10 Claims

1. Process for the manufacture of charges for gas generators from solid compositions generating nontoxic gases, whose constituents comprise at least (i) an alkali metal or alkaline-earth metal azide, (ii) a metal sulphide chosen from the group consisting of molybdenum sulphide or mixed molybdenum sulphides, and (iii) sulphur, by mixing the said constituents and compression-forming, characterized in that, after being formed, the said charges are heated to a temperature equal to at least 120° C. for a period equal to at least 5 minutes.

4,963,203

HIGH- AND LOW-TEMPERATURE-STABLE THERMITE COMPOSITION FOR PRODUCING HIGH-PRESSURE, HIGH-VELOCITY GASES

Danny L. Halcomb, Camden, and Jonathan H. Mohler, Spring Valley, both of Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 29, 1990, Ser. No. 500,829

Int. Cl.[5] C06G *33/00*

U.S. Cl. 149—37 16 Claims

1. A high- and low-temperature-stable thermite composition for producing high-pressure, high-velocity gases, consisting essentially of

(a) an oxidizable metal;

(b) an oxidizing reagent;

(c) a high-temperature-stable gas-producing additive selected from the group consisting of metal carbides and metal nitrides.

4,963,204

PYROTECHNIC DELAY COMPOSITIONS

Günther Faber, Siegburg; Hans Florin, Troisdorf; Peter-Josef Grommes, Troisdorf, and Peter Röh, Troisdorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Mar. 8, 1989, Ser. No. 320,772

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1988, 3808366

Int. Cl.[5] C06B *33/12*

U.S. Cl. 149—40 4 Claims

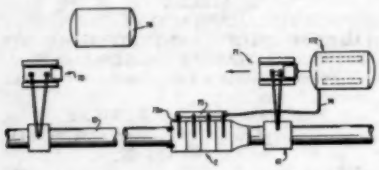
1. A pyrotechnic time delay composition with a delay period in the seconds range, comprising powdered metallic tungsten, barium chromate, potassium perchlorate and barium hexafluorosilicate.

4,963,205

EFFICIENCY PROCESS AND APPARATUS FOR EMBRITTLING AN OUTER PROTECTIVE COATING OF A PIPE OR PIPELINE

Jean-Luc Hubert, Willowbrook, Ill., assignor to Liquid Air Corporation, Walnut Creek, Calif.

Filed Nov. 13, 1989, Ser. No. 434,814
Int. Cl.[5] B32B *31/24*
U.S. Cl. 156—80 46 Claims



1. A process for embrittling an outer protective coating of at least a pipe section of a transmission pipeline, comprising the steps of:

enclosing a portion of the pipe section in a pipeline travelling tunnel means so as to define an annular space around said protective coating; and

expanding a pressurized LN2 cryogen into said space in such a way as to embrittle the protective coating throughout the thickness thereof by depositing a layer of LN2 droplets onto the coated surface of the pipe,

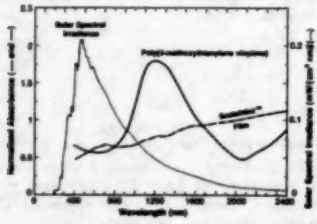
wherein said deposition of a layer of LN2 droplets comprises spraying at least a part of said LN2 droplets onto said coating so as to form a plurality of LN2 patterns on said coating, said patterns having a surfacic coverage of less than 50% of the coating on the pipe section.

4,963,206

METHOD OF MAKING A THERMAL WINDOW GLAZING WITH CONDUCTIVE POLYMER COATING TO BLOCK RADIATIVE HEATING

Lawrence W. Shacklette, Essex; Kwan-Yue Jen, Middlesex; Helmut Eckhardt, Morris; Ronald L. Elsenbaumer, Morris, and Ray H. Baughman, Morris, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed May 4, 1989, Ser. No. 347,546
Int. Cl.[5] B32B *31/12, 17/10*
U.S. Cl. 156—99 32 Claims



1. A method for minimizing radiative heat transfer and maximizing the transmission of visible light through a window, having at least one pane, comprising the step of: applying a transparent conductive polymer layer to said pane, said polymer layer being reflective and absorptive in an infrared region of the electromagnetic spectrum having a wavelength range extending from 780 to 2500 nm, being transparent in a visible region of the spectrum having a wavelength range extruding from 400 to 780 nm, and having a transparenccy ratio greater than 2.

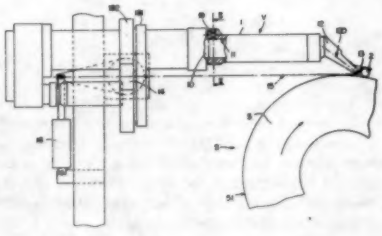
2. A method as recited in claim 1, further comprising the step of coating said conductive polymer layer on a flexible plastic substrate which is then associated with said pane.

4,963,207

METHOD AND APPARATUS OF MANUFACTURING A TIRE BY THE LAYING OF RUBBER PRODUCTS ONTO A FIRM SUPPORT

Daniel Laurent, Meylan, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand Cedex, France

Filed Sep. 10, 1987, Ser. No. 95,472
Claims priority, application France, Sep. 17, 1986, 86/13104
Int. Cl.[5] B29D *30/16, 30/60*
U.S. Cl. 156—117 4 Claims



1. A method of manufacturing a tire wherein, successively, in the order required by the architecture of the tire, rubber products and reinforcement elements are laid for progressively building a blank of the tire on a firm rotatable support, the laying of certain rubber products being direct bonded on the rotating surface by means of at least one volumetric extruder which discharges a controlled volume of rubber product from a chamber through an outlet orifice by the controlled volume displacement of the extruder relative to the chamber, the outlet orifice of the chamber being positioned with respect to said support adjacent the place on the rotating surface where the rubber product is to be applied to lay down continuously for direct bonding on the blank a stream of extruded material having a width substantially narrower than the surface to be built in order to build the blank in a plurality of rotations of said support, and progressively building up the blank by controlling the volume of the extrusion in relation with the rotation of the support and the radius of laying, the amount of rubber product laid being controlled by the extrusion of a predetermined volume at each location along the circumference of the rotating surface where the rubber product is to be laid by the volumetric extruder, in relation with the rotation of the said support and the radius of laying, the profile of the rubber product to be produced being obtained by a substantially meridian displacement of said orifice with respect to the rotation of said laying surface.

4,963,208

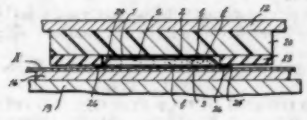
SYSTEM FOR APPLYING DECORATIVE DEVICES TO GARMENTS AND THE LIKE

Charles W. Muncy, 9953 Lewis & Clark Blvd., St. Louis, Mo. 63136, and Peter Stulberger, 2544 Cobblewood Dr., Northbrook, Ill. 60062

PCT No. PCT/US87/02580, § 371 Date Oct. 6, 1987, § 102(e) Date Oct. 6, 1987, PCT Pub. No. WO89/03315, PCT Pub. Date Apr. 20, 1989
PCT Filed Oct. 6, 1987, Ser. No. 123,856
Int. Cl.[5] B32B *31/20, 3/02, 15/02*
U.S. Cl. 156—145 16 Claims

8. A method for applying to fabric articles a decorative device preconstructed of precontoured interengaged thermo-

plastic sheets of predetermined configuration having a pouch portion and a marginal portion having normally exterior and interior faces, providing a press having a fixed bed for disposition thereon of the article to receive the decorative device, providing a pressure platen, providing means for moving said pressure platen between upper, inoperative position and lowered or operative position, providing a pressure block receiving the pouch of said decorative device for disposition thereover, said block being interposed between said fixed bed and said pressure plate, the provided pressure block comprising a rigid unyieldable base having opposed, normally outer and inner faces, there being a layer of resilient material secured to the normally inner face of said base, the provided layer of



resilient material being provided with an opening in corresponding configuration to that of the associated decorative device, and being of a depth slightly greater than that of the pouch of the associated decorative device, applying a heat activated bonding composition on the normally interior faces of the pouch marginal portions in confronting relationship and extending beyond the adjacent margin of the layer of resilient material for flatwise disposition upon the present portion of the article for pressure imposed position between pressure block and the fixed bed, there being provided also means for heating said fixed bed for activating the heat bonding composition provided on the normally interior faces of the marginal portion of the decorative device to be applied to effect fusing thereof.

4,963,209

METHOD FOR MAKING STRETCHED SURFACE RECORDING DISK

John G. Chernega, Stillwater; John A. Martens, Lino Lakes Township, Anoka County; Felix P. Lau, Woodbury, and Leslie M. Milner, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 69,328, Jul. 2, 1987, Pat. No. 4,835,647, which is a continuation of Ser. No. 684,942, Dec. 21, 1984, abandoned. This application Mar. 1, 1989, Ser. No. 317,817

Int. Cl.[5] B32B *31/00*; G11B *5/82, 5/66, 5/70*

U.S. Cl. 156—160 **3 Claims**

1. A method for making a stretched surface recording disk comprising at least one circular recording medium film which is concentric with and bonded in radial tension to an annular support, which method comprises the following steps:

(A) providing:

(1) an annular support having

(a) at least one base portion between its inside and outside diameters;

(b) an outer raised annular ridge attached to and projecting from the base portion; and

(c) at least one circular outer attachment surface located at or near the outer circumference of the annular support and having a diameter greater than that of the innermost part of the outer raised annular ridge; and

(2) a polymeric sheet which will be the substrate of the annular recording medium film;

(B) applying to the outer attachment surface of the annular support an adhesive selected from the group consisting of acrylate and methacrylate functional adhesives which are curable by ionizing radiation and which, when cured, have a shear strength effective to maintain radial tension in the circular recording medium film of the finished product;

(C) adhering the annular support to the polymeric sheet by

(1) placing the polymeric sheet in contact with the outer attachment surface of the annular support in a manner such that the attachment surface is accessible to ionizing radiation while, at the same time, imposing radial tension on the polymeric sheet, and

(2) curing the adhesive by exposing it to ionizing radiation.

4,963,210

METHOD OF MAKING ELONGATE ARTICLES HAVING HIGH DIMENSIONAL STABILITY

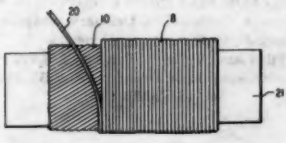
Horst Corr, Übach-Palenberg; Rudolf Hackenberg, Langerwehe-Jüngersdorf, and Bernd-Horst Schmitz, Stolberg, all of Fed. Rep. of Germany, assignors to URANIT GmbH, Jülich, Fed. Rep. of Germany

Filed May 18, 1989, Ser. No. 353,496

Claims priority, application Fed. Rep. of Germany, May 20, 1988, 3817174

Int. Cl.[5] B31C *13/00*; B65H *81/00*

U.S. Cl. 156—172 **7 Claims**



1. A method of producing an elongate article comprising the steps of:

(a) providing a plurality of superposed layers composed of a wound filament in a plastic matrix to form a hollow cylinder having open ends and a cylinder axis parallel to a length of the cylinder at least one of the layers being formed of a circumferential winding and at least one of the layers being formed of a cross winding; said cross winding comprising fibers having a negative coefficient of thermal expansion; said cross winding being oriented at an inclined angle to the cylinder axis; and

(b) securing the open ends of the hollow cylinder end pieces; said end pieces having a length measured parallel to the cylinder axis, and said inclined angle having such a magnitude that temperature-causes changes in the length of the hollow cylinder compensate for temperature-caused changes in the length of the end pieces so that the hollow cylinder expands when the end pieces contract during a decrease in temperature and so that the hollow cylinder contracts when the end pieces expand during an increase in temperature.

4,963,211
METHOD OF AND MACHINE FOR WINDING TUBES FROM STRIP

Peter Allen, Columbia, Md., and Sydney Molyneux, Brisbane, Australia, assignors to Danby Pty, Ltd., Queensland, Australia

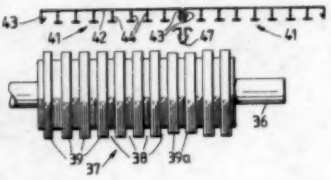
PCT No. PCT/AU87/00403, § 371 Date May 25, 1989, § 102(e) Date May 25, 1989, PCT Pub. No. WO88/03865, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 26, 1987, Ser. No. 362,454

Claims priority, application Australia, Nov. 26, 1986, PH9166

Int. Cl.[5] B32B *7/00, 31/00*

U.S. Cl. 156—195 **10 Claims**



7. A method of winding a tube from strip including the steps of:

introducing a tube forming strip into the annular space between a fixed cylindrical outer sleeve and a cylindrical core rotating coaxially within the outer sleeve;

guiding the tube forming strip by pressure means on the sleeve and entering the annular space, to form about the rotating core a helix with closely adjacent convolutions; and

introducing a locking strip into the annular space and into engagement with the adjacent edge portions of the said adjacent convolutions.

4,963,212
METHOD FOR MAKING A COMPOSITE BODY

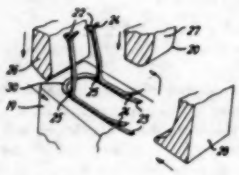
George Rasmussen, Gredstedbro, Denmark, assignor to Ploughmann & Vingtoft, Copenhagen K, Denmark

Filed Aug. 31, 1988, Ser. No. 238,892

Claims priority, application Denmark, Aug. 31, 1987, 4551/87

Int. Cl.[5] B32B *31/18*

U.S. Cl. 156—222 **14 Claims**



1. A method for making wood furniture frames, and the like comprising:

providing a plurality of sheets of wood each having a longitudinally oriented grain, and being shaped to be bent in a direction generally transverse to the direction of the grain;

positioning the sheets in a generally overlying relationship, with the grain of each of the sheets oriented in the same general direction;

applying a curable adhesive between adjacent surfaces of the sheets;

bending the sheets with applied adhesive in a first direction generally transverse to the direction of the grain to form a predetermined shape;

curing the adhesive to form a solid laminate with the predetermined shape;

cutting the laminate in a direction generally parallel to the direction of the grain to form a plurality of formed strips;

positioning a plurality of the strips in an overlapping, nonplanar relationship configured to form a selected furniture frame;

applying a curable adhesive between adjacent surfaces of the strips;

bending the strips with applied adhesive in a second direction generally transverse to the direction of the grain and different from said first direction to form a predetermined shape corresponding to the shape of the selected furniture frame; and

curing the second named adhesive to form a solid laminated furniture frame having a three dimensional configuration.

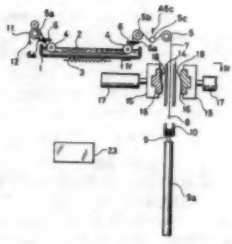
4,963,213
METHOD OF AND DEVICE FOR GLUING OBJECTS TOGETHER USING A POROUS SHEET APPLICATOR

Kunihiko Kanoh, Togura; Tadaomi Sunohara, Kohshoku, and Chushiro Hayasaka, Sayama, all of Japan, assignors to Morikawa Seagyo Kabushiki Kaisha, Nagano, Japan

Filed Jul. 31, 1989, Ser. No. 387,846

Int. Cl.[5] B32B *31/12, 31/18*

U.S. Cl. 156—249 **13 Claims**



1. A method of gluing objects which have adhesion surfaces together, comprising the steps of: preparing a flexible porous sheet having a multitude of pores, suspending said porous sheet so as to allow it to be pulled down, allowing an adhesive agent to adhere to the multitude of pores of said porous sheet, bringing the adhesion surfaces of the objects to be glued together into contact with said porous sheet on both sides thereof so as to allow the adhesive agent to adhere to said adhesion surfaces of the objects to be glued together, separating said adhesion surfaces from said porous sheet, and bringing together the above mentioned adhesion surfaces before the adhesive agent has cured.

4,963,214
METHOD FOR PRODUCING A WOODEN DECORATIVE ARTICLE

Ritsuo Iwata; Tomohide Ogata; Kaneo Omoto; Hironao Nagashima; Koji Nakajima, and Yutaka Miyamoto, all of Shizuoka, Japan, assignors to Yamaha Corporation, Japan

Filed Dec. 8, 1988, Ser. No. 281,807

Claims priority, application Japan, Dec. 8, 1987, 62-310024; Dec. 9, 1987, 62-311617; Dec. 9, 1987, 62-311618; Dec. 10, 1987, 62-312499; Dec. 10, 1987, 62-312500; Dec. 29, 1987, 62-333221; Dec. 29, 1987, 62-199882

Int. Cl.[5] B32B *31/00*

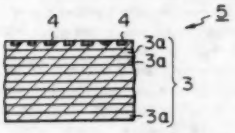
U.S. Cl. 156—276 **36 Claims**

1. A method for producing a wooden decorative article, said method comprising the steps of:

impregnating a material sheet made of woven fibers with

hardenable resin solution to form a resin impregnated sheet;

placing small wooden pieces on a surface of said impregnated sheet to form a laminated composite; and



hardening said laminated composite by heating under pressure.

4,963,215

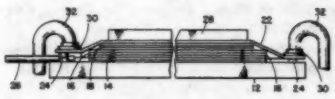
METHOD FOR DEBULKING PRECURED THERMOPLASTIC COMPOSITE LAMINAE

Donald J. Ayers, Snohomish, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 129,047, Dec. 7, 1987, abandoned. This application Jun. 14, 1989, Ser. No. 368,165

Int. Cl.[5] B32B *31/00*

U.S. Cl. 156—286 **5 Claims**



1. A method for forming a thermoplastic laminate having a desired laminate thickness, from a plurality of layers of at least partially precured thermoplastic composite material, comprising the steps of:

positioning a plurality of non-tacky, partially precured thermoplastic composite layers one on top of another on a forming tool to form a bulky laminate stack having a height substantially greater than the desired laminate thickness;

positioning a vacuum bag over the laminate stack and forming tool;

applying pressure to the vacuum bag only after the laminate stack is assembled to debulk the laminate stack to approximately the desired laminate thickness wherein during the pressure applying step a substantially continuous pressure of approximately 10 to 15 psig. is applied and maintained;

tensioning the vacuum bag to eliminate wrinkles and maintaining said pressure during tensioning and

sealing the vacuum bag to the forming tool and maintaining said pressure during sealing.

4,963,216

METHOD AND APPARATUS FOR THE ASSEMBLY OF FRICTION COMPONENTS

Adrian H. Watkins, Rugby, England, assignor to Automotive Products plc, Warwickshire, England

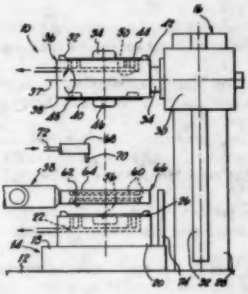
Filed Jul. 10, 1989, Ser. No. 377,318

Claims priority, application United Kingdom, Jul. 27, 1988, 8817493

Int. Cl.[5] B32B *31/12*; F16D *69/04*

U.S. Cl. 156—291 **10 Claims**

1. A method for the manufacture of a friction clutch plate which comprises the steps of placing first and second friction components in first and second jig means respectively, depositing a bead of adhesive elastomeric material on the upper face of the first friction component, placing a metal carrier plate on top of the deposited bead, depositing a bead of adhesive elastomeric material on one face of the second friction component, placing the face of the second friction component having the elastomeric bead on top of the metal carrier plate and holding



the two friction components and metal carrier plate together for a desired time period such that the assembled clutch plate is handleable prior to curing the elastomeric material.

4,963,217

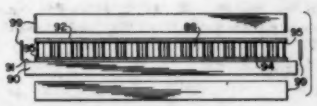
METHOD OF MAKING A PLANAR WORK SURFACE

Robert J. Pavone, South Windsor, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.

Division of Ser. No. 153,810, Feb. 8, 1988, Pat. No. 4,816,847. This application Jan. 3, 1989, Ser. No. 292,763

Int. Cl.[5] B32B *31/14*

U.S. Cl. 156—295 **14 Claims**



1. A method of forming a planar surface on a support infrastructure having edge portions defining first and second faces comprising the steps:

providing said support infrastructure in the form of a honeycomb structure defined by a matrix of chambers;

utilizing a tool having an accurately planar top work surface;

providing a thin first sheet of material capable of conforming to said accurately planar top work surface of said tool when placed on it to define said planar surface;

placing said thin first sheet of material upon said accurately planar top work surface to conform said first thin sheet of material to the accurately planar dimension of said top work surface of said tool;

applying a layer of adhesive to the surface of said first thin sheet of material not in contact with said top work surface of said tool;

positioning said support infrastructure over said adhesive layer and orienting said support infrastructure first face in confrontation with said adhesive layer applied to said first thin sheet of material;

placing said support infrastructure first face onto said first thin sheet material through said adhesive layer such that any gaps formed by the edge portions of said infrastructure first face not contacting with said thin sheet of material are filled by said adhesive; and

allowing said adhesive to set and harden to thereby rigidly maintain the planar dimension defined by said top work surface on said thin first sheet of material.

4,963,218

METHOD FOR REINFORCING PATTERN PIECES

Tina N. Rainey, 3042 Sherwood La., St. Charles, Mo. 63301

Filed Jun. 23, 1989, Ser. No. 370,786
Int. Cl.[5] B32B *31/20*
U.S. Cl. 156—299 9 Claims

1. A method of reinforcing pre-existing pattern pieces which may be performed without extensive commercial equipment consisting of:

(a) placing a backing material, coated on one side with a thermoplastic material, on a flat, heat-resistant surface with the coated side up;

(b) placing said pre-existing pattern pieces on said coated backing material and arranging said pattern pieces in such manner that no overlapping of individual pattern pieces occurs;

(c) placing a protective lightweight material over said pre-existing pattern pieces as arranged on said coated backing material;

(d) applying heat to said protective lightweight material for a sufficient amount of time so as to soften or partially melt the thermoplastic coating on said backing material and applying sufficient pressure so as to cause said pre-existing pattern pieces to bond to said coated backing material;

(e) allowing the bonded assembly of pre-existing pattern pieces and coated backing material to cool; and

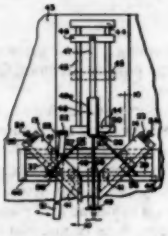
(f) removing said protective material from said bonded assembly of pre-existing pattern pieces and coated backing material.

4,963,219

METHOD OF MAKING AND ASSEMBLING ROOF EDGE STRUCTURES INCORPORATED WITH SINGLE-PLY POLYMER-COATED FABRIC ROOF STRUCTURES

Wayne G. Nichols, Bay City; John C. Greko, Saginaw, and Francis R. Laurion, Vassar, all of Mich., assignors to Duro-Last Roofing, Inc., Saginaw, Mich.

Division of Ser. No. 197,580, May 5, 1988, Pat. No. 4,848,045. This application Apr. 17, 1989, Ser. No. 340,138
Int. Cl.[5] B29C *65/00*
U.S. Cl. 156—304.2 2 Claims



1. A method of forming roof edge, mitered corner sections consisting of a pair of thermoplastic pieces forming a right angle, with each piece having a generally vertical side facia wall integrally joined to a generally horizontal top wall and with each piece having its top wall and facia wall cut away along complementary matching angles at confronting ends to form a mitered corner, the vertical facia walls of the pieces having outboard and inboard surfaces forming the exterior and interior walls of the corner, the method employing support templates extending generally at right angles one to the other in spaced apart relation, with one of the templates being mounted for linear travel toward the other and with a heated block, having flat side walls mounted for reciprocatory travel from a position between said templates to a position removed from the space between them, the heated block also being mounted for slight lateral shifting movement relative to the templates, the steps of:

a. clamping said pieces to the respective templates with their confronting ends facing one another to leave a space between them, and their facia and top walls in parallel confronting relationship.

b. then relatively outwardly moving the heated block in a direction generally parallel to said confronting ends to confront and span said confronting ends of the pieces.

c. moving said one template toward the other template to move the confronting end of the piece clamped to it into engagement with the block;

d. continuing to move said one template to shift the block laterally into engagement also with the confronting end of the piece clamped to the other template to melt and plastify the confronting edges of each piece;

e. moving the block relatively to the templates in an inward direction to wipe the vertical facia walls of the confronting ends of the pieces in a direction from the exterior surface to the interior surface to wipe any liquid material away from the exterior vertical facia wall surfaces of the pieces to the interior wall surfaces.

f. converging said templates to bring the plastified edges into engagement and force the confronting edges together for a sufficient time to weld them along a seam; and

g. unclamping said pieces from the templates.

4,963,220

ADHESIVE SYSTEM UTILIZING METAL ION-CONTAINING ACTIVATOR

Andrew G. Bachmann, Harwinton, and Robert F. Bickley, Middlebury, both of Conn., assignors to Dymax Corporation, Torrington, Conn.

Continuation of Ser. No. 147,286, Jan. 22, 1988, abandoned. This application May 1, 1989, Ser. No. 346,249
Int. Cl.[5] C09J *175/16, 5/04*
U.S. Cl. 156—307.3 27 Claims

1. As a two-part, chemically activated adhesive system, the combination including:

an adhesive formulation that is polymerizable under both aerobic and anaerobic conditions, comprising at least one polymerizable acrylate monomer, at least one elastomeric domain-providing filler, about 0.5 to 5.0 percent by weight of an organic acid that is capable of cyclic tautomerism, and a perester catalyst in an amount sufficient, when activated, to effectively initiate polymerization of said monomer; and

a chemical activator formulation comprising an aldehyde/amine condensation product capable of activating said perester catalyst to initiate polymeriztaion of said monomer, and 0.001 to 0.5 percent, based upon the weight of said activator formulation, of a metal accelerator selected from the group consisting of ferric ion, cupric ion and ferrous ion.

4,963,221

HOT PRESS INCLUDING CAM ROD PENETRATING TOP PLATEN

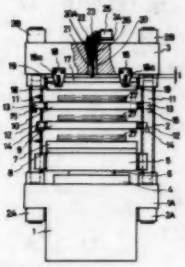
Koukichi Isobe, Toukai, and Masahiko Ogawa, Nagoya, both of Japan, assignors to Kabushiki Kaisha Meiki Seisakusho, Japan

Filed Sep. 28, 1987, Ser. No. 101,406
Claims priority, application Japan, Sep. 29, 1986, 61-230432; Sep. 30, 1986, 61-231696
Int. Cl.[5] B30B *1/32, 7/02, 15/20*
U.S. Cl. 156—358 4 Claims

1. A hot press which is provided with a base platen, a top platen supported by a plurality of tie rods fixed uprightly on said base platen, a movable platen guided movably by said tie rods, at least one hydraulic cylinder for elevating or lowering said movable platen, at least two heating plates guided movably between said top platen and movable platen and means for maintaining a predetermined space between each adjacent heating plate when said movable platen is positioned at a lowest limit, comprising:

a top heating plate hung movably down from said top platen by support means,

a cam rod moving in cooperation with movement of said top heating plate and penetrating through said top platen,



means for detecting a start of elevation of said top heating plate by an electric means mounted on the top platen for detecting the motion of said cam rod and generating a signal for switching a control of said hydraulic cylinder from a speed control to a pressure control.

4,963,222

INSTALLATION FOR MANUFACTURE OF MULTI-STRAND ELECTRIC CABLE

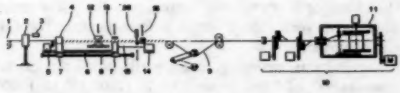
Jacques L. Bonjour, Epalinges, and Dan G. Baz, Ecublens, both of Switzerland, assignors to Maillefer S.A., Ecublens, Switzerland

Division of Ser. No. 130,633, Dec. 9, 1987, Pat. No. 4,837,405. This application Mar. 7, 1989, Ser. No. 319,703

Claims priority, application Switzerland, Dec. 18, 1986, 5052/87

Int. Cl.[5] B32B *31/08*; H01B *13/02*

U.S. Cl. 156—393 **8 Claims**



1. A production-line installation for manufacturing electric cable having an assembly of individual conductors and a jacket, comprising:

payout means for unreeling a web of insulated conductors and a jacket, comprising:

payout means for unreeling a web of insulated conductors having each an insulating sheath,

first and second stranding units having parallel axes, said second unit being situated downstream from said first unit, said units being arranged for stranding said conductors into a number of separate parallel strands over successive grouped segments of said web, having predetermined lengths,

a welding station including a plurality of guiding and clamping means, for bonding said sheaths parallel to one another over successive intermediate bonded segments of said web having predetermined intermediate lengths and located between said grouped segments, and

a main stranding device situated downstream from said welding station, for stranding said assembly.

4,963,223

ROTARY-APPARATUS FOR GLUEING THE OUTER END OF A STICK OF WOUND PAPER MATERIAL

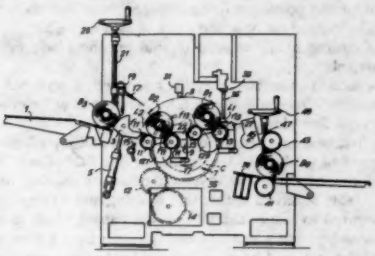
Guglielmo Biagotti, Via Di Vorno, 55060 Vorno (LU), Italy

Filed Apr. 6, 1989, Ser. No. 333,969

Claims priority, application Italy, Apr. 8, 1988, 9380 A/88

Int. Cl.[5] B65H *19/29, 75/28*

U.S. Cl. 156—456 **11 Claims**



1. An apparatus for gluing the end portion of the strip of paper material in rolls, comprising at least one pair of rollers, constrained to rotate in the same direction and with the same speed of rotation, for receiving and making the reel rotate, stopping its rotation and supporting it during the subsequent phases, conveyor means for supporting said pair of support rollers and displacing them from the position for receiving the reel and for unwinding the portion, to the position for gluing the portion and from this position to the unloading position; means for making the or each pair of support rollers rotate until the portion of the reel carried on the said rollers is unwound; blown-air means for causing opening of the portion; surfaces for accommodating the open portion, adjacent to the or to each pair of support rollers, with which surfaces pneumatic means for holding said open portion are associated; and means for dispensing the glue on the unwound portion; wherein said pair or said pairs of rollers (11,11; 13,13) are mounted on a device (7) without a chain conveyor, said device rotating about a fixed axis (9), there being associated with said device (7) means designed to keep the axes of the rollers of each pair on a horizontal plane during rotation of the device (7) itself, and means for imparting to said pair or said pairs of rollers an oscillation for unloading the glued reel.

4,963,224

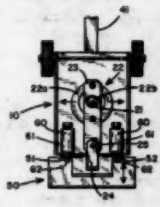
MOTORIZED CARPET AND TILE STRIPPING TOOL

Martin L. Anderson, Rte. 3, Box 60, Maple Lake, Minn. 55358

Filed Dec. 26, 1989, Ser. No. 457,193

Int. Cl.[5] B32B *31/18*

U.S. Cl. 156—584 **1 Claim**



1. A carpet and tile stripping machine comprising:

a. a frame;

b. a pair of wheels rotatably mounted on the rear of the frame;

c. handle means projecting from the frame for guiding the stripping machine;

d. motor means mounted on said frame, said motor means including a drive shaft projecting generally vertically through said frame;

e. eccentric means coupled to said motor shaft for producing orbital motion in a substantially horizontal plane;

f. a cutting blade mounting assembly positioned in front of said frame, said mounting assembly including a blade mounting portion, a first elongated drive bar, and a pair of tabs located on opposite sides of said drive bar;

g. a cutting blade secured to said cutting blade mounting assembly;

h. a second elongated drive bar secured at one end to the eccentric means and pivotally connected at its other end to the first elongated drive bar;

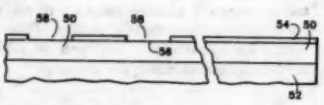
i. a first bearing comprising a housing and a push rod, said housing secured to the frame on one side of said second elongated drive bar and said push rod having one end slidably received within said housing and its opposite end secured to one of the tabs on the cutting blade mounting assembly, and a second bearing comprising a housing and a push rod, said housing secured to the frame on the other side of said second elongated rive bar and said push rod having one end slidably received within said housing and its opposite end secured to the other of said tabs on the blade mounting assembly, said first and second bearings along with the pivotal connection between said first and second elongated rive bars serving to eliminate any lateral motion of the cutting blade mounting assembly so the cutting blade only moves back and forth in a straight line path of travel with respect to the frame in a selected horizontal plane.

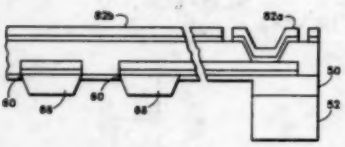
4,963,225

METHOD OF FABRICATING A CONTACT DEVICE

Gail R. Lehman-Lamer, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 20, 1989, Ser. No. 424,467
Int. Cl.[5] B44C 1/22; C03C 15/00; C23F 1/00
U.S. Cl. 156—630 **6 Claims**





1. A method of fabricating a contact element on a sheet of dielectric material, comprising:

(a) providing a first layer of dielectric material having first and second opposite surfaces and at least one opening,

(b) depositing conductive material in said opening,

(c) depositing a second layer of dielectric material over the first surface of the first layer and over the conductive material in said opening, and

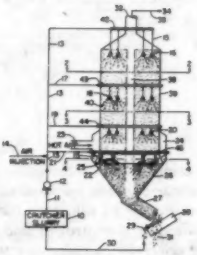
(d) removing material of the first layer from its second surface so that the conductive material projects beyond the first layer.

4,963,226

PROCESS FOR SPRAY-DRYING DETERGENT COMPOSITIONS

Harry R. Chamberlain, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 23, 1989, Ser. No. 300,521
Int. Cl.[5] B01D 1/18
U.S. Cl. 159—48.1 **10 Claims**



1. A continuous method for spray-drying large volumes of a detergent slurry in a spray-drying tower and producing a granular detergent composition having controlled density with minimum production of dust particles and vapor effluents comprising the following steps:

(a) preparing an aqueous detergent slurry having from about 10 to 50% by weight water and from about 50 to 90% by weight solids content being comprised of at least one detergent surfactant or detergency builder, or mixtures thereof;

(b) establishing within the chamber of the spray tower (a) a cylindrically shaped drying zone with the axis of the chamber by passing heated drying air upwards through the chamber in a cyclonic motion and (b) a low-pressure concentric vortex zone which is formed along the axis of the chamber;

(c) continuously spraying, cocurrently with air having a temperature of from about 500° F. (260° C.) to 1000° F. (538° C.) and a velocity of from about 3000 to about 6000 ft./min. (15.2 to 30.4 m/sec), from about 30 to 100% by weight of said detergent slurry directly into the cylindrically shaped drying zone, said spraying being achieved with atomizing nozzles substantially uniformly spaced in a horizontal plane through the cylindrical drying zone, thereby providing that substantially each of the sprays disintegrates into particles within said cylindrical drying zone;

(d) continuously spraying countercurrently any remaining balance of said detergent slurry directly into the cylindrically shaped drying zone at a higher level in the spray tower than the cocurrent spraying of step (c) by means of at least one level of atomizing nozzles substantially uniformly spaced in a horizontal plane through the cylindrical drying zone, thereby providing that substantially each of the sprays disintegrates into particles within said cylindrical drying zone;

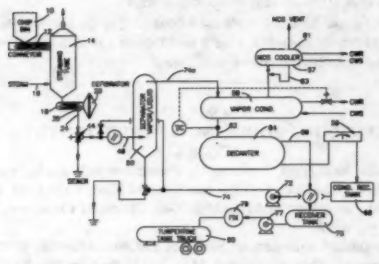
whereby the only disintegrated particles entering the low-pressure vortex zone are those carried by the cyclonic motion of the drying gas.

4,963,227

SYSTEM AND APPARATUS FOR RECOVERY OF TURPENTINE FROM THERMOMECHANICAL PULPING PROCESS

Ellis W. Reynolds, 2506 Acadie Dr., Jacksonville, Fla. 32217

Filed Feb. 26, 1990, Ser. No. 485,047
Int. Cl.[5] D21C *11/06*
U.S. Cl. 162—14 **8 Claims**



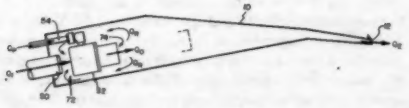
1. A system for recovering turpentine from a thermomechanical pulping process for making paper and utilizing a plug screw conveyor for feeding steam heated pine chips to a defibrator, which system comprises collecting under superatmospheric pressure and elevated temperature the liquid expressed from said chips, flashing the collected liquid into a vapor/liquid separator by releasing the pressure on said liquid, condensing the vapor containing turpentine and water. collecting the liquid condensate in a decanter, and isolating the turpentinecontaining oil phase from the water phase.

4,963,228

HEADBOX HAVING COANDA NOZZLE FOR MIXING SLURRY THEREIN

Conrad Steen, Mobile, Ala., assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Oct. 27, 1989, Ser. No. 428,351
Int. Cl.[5] D21F *1/02*
U.S. Cl. 162—344 **13 Claims**



1. In combination with a headbox used in connection with a paper making arrangement and having a discharge gap for discharging paper pulp slurry onto a web-forming surface, the improvement comprising:

a slurry nozzle communicating under pressure a source of paper pulp slurry with said headbox at a certain rate;

a Coanda nozzle disposed within said headbox and having a slurry inlet, a slurry outlet, and a primary flow slit in communication with the slurry inlet and slurry outlet, the slurry inlet being aligned in flow direction with said slurry nozzle while being spaced therefrom said Coanda nozzle having a Coanda effect surface therein adjacent the primary flow slit and being a curved surface initially substantially parallel to a flow axis of the primary flow slit and deviating therefrom in a smooth curve toward the slurry outlet; and

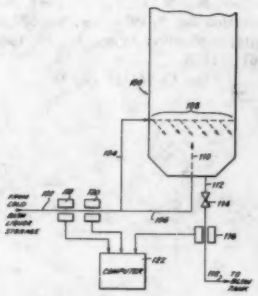
means for communicating a primary flow fluid under pressure to said primary flow slit structured and arranged such that primary fluid exits from the primary flow slit into said Coanda nozzle and entrains a secondary flow of slurry from said slurry nozzle through said Coanda nozzle from the slurry inlet to the slurry outlet, and structured and arranged such that the primary fluid also entrains a recirculation flow of slurry from the outlet of the Coanda nozzle through said headbox and into the inlet of the Coanda nozzle.

4,963,229

SYSTEM AND METHOD FOR CONTINUOUS MEASUREMENT OF PULP CONSISTENCY IN A BLOWLINE OF A CONTINUOUS PULP DIGESTER

Khaim Lisayansky, and H. Heinz Walbaum, both of Chester, N.Y., assignors to International Paper Company, Purchase, N.Y.

Filed Jul. 2, 1985, Ser. No. 751,365
Int. Cl.[5] D21C *7/12*; D21F *7/06*
U.S. Cl. 162—49 **13 Claims**



5. A system for continuously determining pulp consistency in a discharge blowline of a continuous pulp digester having a cold blow liquor line for providing cold blow liquor to the digester to wash the pulp by substantially replacing strong black liquor in the pulp slurry with cold blow liquor prior to discharging the pulp slurry into the discharge blowline of the digester comprising:

a first measurement means disposed adjacent to the blowline for continuous measurement of the density of the pulp slurry passing through the blowline and for continuous generation of signals indicative of the pulp slurry density;

a second measurement means disposed adjacent to the cold blow liquor line for continuous measurement of the density of the cold blow liquor passing through the cold blow liquor line to predict the density of pulp slurry liquor in the discharge blowline and for continuous generation of signals indicative of the density of the cold blow liquor; and

a computing means connected to the first and second measurement means for calculating pulp consistency in the pulp slurry passing through the blowline based on the continuous signals received from the first and second measurement means which are indicative of pulp slurry density and cold blow liquor density, respectively.

12. A method of continuously determining pulp consistency in a discharge blowline of a continuous pulp digester having a cold blow liquor line for providing cold blow liquor to the digester for washing the pulp by substantially replacing strong black liquor in the pulp slurry with cold blow liquor prior to discharging the pulp slurry into the discharge blowline of the digester comprising the steps of:

continuously measuring the density of the pulp slurry passing through the blowline and continuously generating signals indicative of the intensity of the pulp slurry;

continuously measuring the density of the cold blow liquor passing through the cold blow liquor line to predict the

density of pulp slurry liquor in the discharge blowline and continuously generating signals indicative of the density of the cold blow liquor; and

continuously computing the pulp consistency of the pulp slurry passing through the blowline with computing means based on continuous signals received by the computing means indicative of the density of the pulp slurry and the density of the cold blow liquor.

4,963,230

AGRICULTURAL PAPER AND PROCESS FOR PRODUCING THE SAME

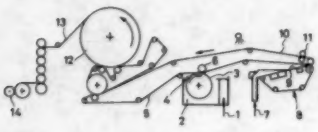
Mitsuru Kawase, Sapporo; Masashi Tanimura; Hidekazu Terasawa, both of Obihiro; Sohei Nakamura; Takayuki Nagano, both of Ebetsu; Shosuke Higashimori, Okayama; Hiroshi Matsuki, Okayama, and Hisashi Matsumoto, Okayama, all of Japan, assignors to Oji Paper Company Ltd.; Kuraray Co., Ltd. and Nihon Tensaiseito Kabushiki Kaisha, all of, Japan

Continuation of Ser. No. 74,713, Jul. 17, 1987, abandoned. This application Jul. 5, 1989, Ser. No. 374,565

Claims priority, application Japan, Jul. 29, 1986, 61-176757; Jul. 30, 1986, 61-181155

Int. Cl.[5] D21F *11/00*

U.S. Cl. 162—129 **14 Claims**



1. A process for producing agricultural paper which comprises forming a first wet layer having a basis weight of greater than 40 g/m^2 up to 60 g/m^2 from a paper stock consisting essentially of natural pulp, forming a second wet layer having a basis weight of 3–15 g/m^2 and consisting essentially of synthetic fibers, and joining at a joining interface the first wet layer with the second wet layer by a wet papermaking process, whereby the fibers of the first and second layers are intertwined at said joining interface.

4,963,231

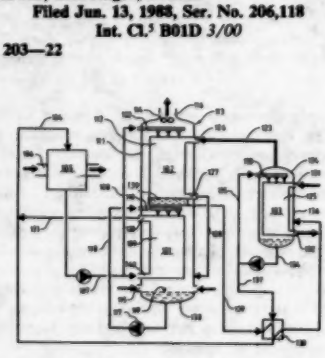
METHOD FOR EVAPORATION OF LIQUIDS

Rolf Ryham, Princeton, N.J., assignor to Ahlströmföretagen Svenska AB, Lindövägen, Sweden

Filed Jun. 13, 1988, Ser. No. 206,118

Int. Cl.[5] B01D *3/00*

U.S. Cl. 203—22 **9 Claims**



1. A process for the evaporative concentration of a liquid or solids containing liquid comprising the steps of:

heating the liquid to be concentrated to its boiling point by indirect heat exchange with a heating fluid in an evaporator to produce vapor;

condensing the vapor in an evaporative condenser having a heat exchange surface at the inside of said heat exchange surface by indirect heat exchange with a cooling liquid flowing over the outside of the heat exchange surface of the condenser thereby evaporating said cooling liquid;

utilizing as a cooling liquid in said condenser the liquid or the solids containing liquid which is concentrated by evaporation in said evaporator; and

causing gas to flow over said heat exchange surface of said condenser in contact with said cooling liquid to lower the vapor pressure above said liquid.

4,963,232

PROCESS FOR PRODUCING A PURIFIED HYDRAZINE HYDRATE

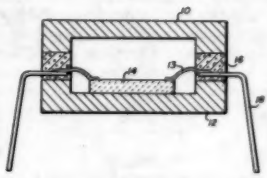
Yasuhisa Kuriyama, Yokkaichi; Shuuzabu Sakaguchi, Toride; Toshiaki Kohzaki, Ushiku, and Syoichi Nito, Yokkaichi, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 198,493, May 25, 1988, abandoned. This application May 22, 1989, Ser. No. 355,188

Claims priority, application Japan, May 28, 1987, 62-129773

Int. Cl.[5] B01D *3/34*; C01B *21/16*

U.S. Cl. 203—29 **14 Claims**



1. A process for producing a purified hydrazine hydrate having a low total organic carbon concentration comprising:

a first step which comprises distilling an aqueous solution of hydrazine containing organic carbon constituents in the presence of at least one salt selected from the group consisting of chloride, sulfate, phosphate and carbonate of (a) the metals of Group Ia and IIa of the Periodic Table of the Elements, (b) ammonium or (c) hydrazinium to concentrate the aqueous solution of hydrazine hydrate by distilling water and the majority of the total organic carbon constituents off and separating the resultant concentrate as a bottom product, and

a second step which comprises distilling the resultant concentrate to recover a purified aqueous solution of hydrazine hydrate as a top product and separating an aqueous solution of the above salt as a bottom product,

the said first step being carried out by feeding the salt in aqueous solution form to an upper stage of a distillation column and feeding the aqueous solution of hydrazine hydrate to a stage lower than the stage to which the aqueous solution of the salt is fed.

4,963,233

GLASS CONDITIONING FOR CERAMIC PACKAGE PLATING

Ranjan J. Mathew, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

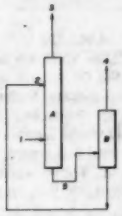
Filed Feb. 9, 1989, Ser. No. 308,702

Int. Cl.[5] C25D *5/02, 5/34*

U.S. Cl. 204—15 **4 Claims**

1. In the processing of glass-sealed ceramic packages

wherein the sealed metal package leads are subjected to cleaning and plating solutions, the improvement comprising:



subjecting the package to a solution of ammonium bifluoride or fluorboric acid in sufficient concentration to ensure that glass seal metallization is minimized during a subsequent metal plating operation.

4,963,234

ELECTROLYTIC PRODUCTION OF QUINONE FROM HYDROQUINONE

Jean Bachot, Bourg la Reine, and Le Roux, Olivier, Paris, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Oct. 16, 1989, Ser. No. 421,833
Int. Cl.[5] C25B *3/02*
U.S. Cl. 204—78 **7 Claims**

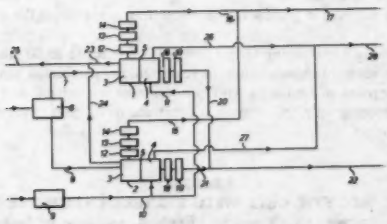
1. A process for the preparation of a quinone, comprising electrolyzing, in the anode compartment of an electrolytic cell, a dispersion or emulsion which comprises a conductive aqueous solution of a corresponding hydroquinone and at least one stable cosolvent which is poorly soluble in water but a good solvent for the final quinone product and a poor solvent for the starting material hydroquinone.

4,963,235

PROCESS FOR TREATING ELECTROLYTIC CELL PRODUCTS

Keith Brattan, Chester; Morris N. Nevin, Frodsham, and Stephen F. Kelham, Northwich, all of England, assignors to Imperial Chemical Industries plc, London, England

Continuation of Ser. No. 640,089, Aug. 13, 1984, abandoned.
This application Apr. 6, 1988, Ser. No. 178,254
Claims priority, application United Kingdom, Aug. 15, 1983, 8321934
Int. Cl.[5] C25B *1/16, 1/26, 15/08*
U.S. Cl. 204—98 **7 Claims**



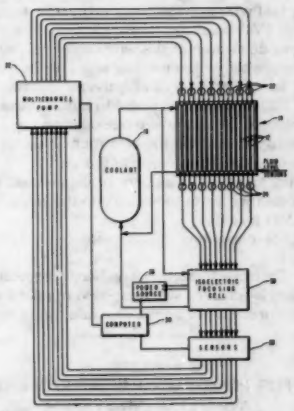
1. In a process in which electrolyte is continuously charged from a source thereof to a plurality of electrolytic cells and is electrolysed therein and from which a gaseous product or products of electrolysis is or are continuously removed therefrom and combined into a common stream, the improvement which comprises associating each electrolytic cell in close proximity with an item or items of apparatus in which a gaseous product or products of electrolysis may be treated after removal from the electrolytic cell and prior to being combined into a single stream, said item or items of the apparatus comprising a compartment or plurality of compartments formed from a plurality of plates and frames, and the process comprising filtering and/or drying a gaseous product or products of electrolysis in the item or items of apparatus prior to combining the gaseous product or products into a single stream.

4,963,236

APPARATUS AND METHODS FOR ISOELECTRIC FOCUSING

L. Scott Rodkey, and G. David Huff, both of Houston, Tex., assignors to Ampholife Technologies and The Board of Regents University of Texas System, both of Houston, Tex.

Filed Mar. 8, 1989, Ser. No. 320,725
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—183.2 **74 Claims**



1. An apparatus for isoelectric focusing of biological amphoteric substances within a fluid containing buffering components capable of establishing a stable pH gradient in an electric field, the apparatus comprising:

an isoelectric focusing cell having a plurality of inlet ports and a plurality of corresponding outlet ports;

a plurality of reservoirs arranged in pairs, each reservoir having a reservoir entrance to allow fluid flow into the reservoir and a reservoir exit to allow fluid flow out of the reservoir; each pair of reservoirs being coupled to a single inlet port of the isoelectric focusing cell and to the corresponding outlet port of the isoelectric focusing cell;

means for directing fluid flow from each outlet port of the isoelectric focusing cell to the respective reservoir pair;

means for directing fluid flow from each reservoir pair to the respective inlet port of the isoelectric focusing cell;

means for alternating the fluid flow into and out of each reservoir of each reservoir pair such that when fluid flows from a first reservoir towards the isoelectric focusing cell, fluid flows from the isoelectric focusing cell towards a second of each reservoir pair such that after the first reservoir empties, fluid is directed to flow from the second reservoir of the respective reservoir pair towards the isoelectric focusing cell and fluid is simultaneously directed to flow into the first reservoir from the isoelectric focusing cell.

4,963,237

METHOD FOR ELECTROCHEMICAL ACTIVATION OF IVD ALUMINUM COATINGS

Robert S. Olds, 11816 Sprucehaven, St. Louis, Mo. 64146, and Kenny Murphy, 215 Hutchinson, Ellisville, Mo. 63011

Filed May 8, 1989, Ser. No. 350,635

Int. Cl.[5] C23C *14/16, 14/32*

U.S. Cl. 204—192.31 4 Claims

1. An improved method for electrochemical activation of IVD aluminum coatings comprising,

a. providing an effective amount of zinc-plated aluminum wire;

b. feeding said plated aluminum wire into the boats within the working chamber of an IVD machine;

c. ion vapor depositing the zinc-plated aluminum wire onto steel substrates at a temperature below the melting point of the zinc;

whereby controlled sacrificial galvanic protection of the steel is achieved when exposed to mild atmospheres without formation of a passive oxide film.

3. An improved method for electrochemical activation of IVD aluminum coatings comprising,

a. providing an effective amount of magnesium-plated aluminum wire;

b. feeding said wire into the boats within the working chamber of an IVD machine;

c. ion vapor depositing of the wire onto steel substrates at a temperature below the melting point of the magnesium;

whereby controlled sacrifical galvanic protection of the steel is achieved when exposed to mild atmosphere, without formation of a passive oxide coating.

4. An improved method for electrochemical activation of IVD magnesium coatings comprising,

a. providing an effective amount of magnesium wire;

b. feeding said wire into the boats into the working chamber of an IVD machine;

c. ion vapor depositing of the wire onto aluminum substrates;

whereby controlled sacrificial galvanic protection of the aluminum is achieved when exposed to mild atmospheres, without formation of a passive oxide film.

4,963,238

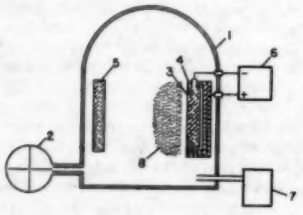
METHOD FOR REMOVAL OF ELECTRICAL SHORTS IN A SPUTTERING SYSTEM

Jerry D. Siefkes, 737 N. Taft Hill Rd., Fort Collins, Colo. 80521; John G. Harpold, 6203 N. County Rd. 29, Bellvue, Colo. 80512, and Douglas S. Schatz, 901 Lochview Ct., Fort Collins, Colo. 80524

Filed Jan. 13, 1989, Ser. No. 297,707

Int. Cl.[5] C23C *14/54*

U.S. Cl. 204—192.12 28 Claims



1. A method of removing electrical shorts caused by a flake in a sputter system, comprising the steps of:

a. driving the sputter system in normal operation by a power supply;

b. detecting the presence of an electrical short caused by a flake across said power supply; and

c. manipulating said power supply in a manner which melts said flake to remove the electrical short.

4,963,239

SPUTTERING PROCESS AND AN APPARATUS FOR CARRYING OUT THE SAME

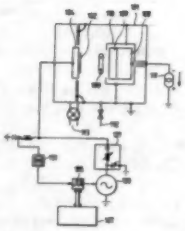
Hideaki Shimamura; Masao Sakata, both of Yokohama; Shigeru Kobayashi, Tokyo; Yuji Yoneoka, Yokohama; Tsuneaki Kamei, Kanagawa; Tsuneyoshi Kawahito, Yokohama; Shoyo Fujita, Gunma, and Hiroshi Nakamura, Saitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 26, 1989, Ser. No. 301,468

Claims priority, application Japan, Jan. 29, 1988, 63-17041; Jan. 29, 1988, 63-17035; Jan. 29, 1988, 63-17034

Int. Cl.[5] C23C *14/42, 14/54*

U.S. Cl. 204—192.12 22 Claims



1. A sputtering process comprising continuously applying a bias voltage having a single polarity to a substrate electrode in a vacuum atmosphere during forming of a film over the surface of a substrate, varying the applied bias voltage and controlling a duty factor of the applied bias voltage so that the magnitude of the kinetic energy of ions of a sputtering gas impacting the substrate is varied periodically.

4,963,240

SPUTTERING ALLOY TARGET AND METHOD OF PRODUCING AN ALLOY FILM

Yoshiharu Fukasawa; Mituo Kawai; Hideo Ishihara; Takenori Umeki, and Yasuhisa Oana, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 29, 1988, Ser. No. 174,959

Claims priority, application Japan, Mar. 30, 1987, 62-74410

Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—192.15 9 Claims

1. A method of producing an alloy film, comprising the steps of:

forming a sputtering target comprising from 15 to 50 atomic percent of molybdenum or tungsten, the remaining atomic percent of tantalum, and concomitant impurities; and

sputtering an alloy film on a substrate using said sputtering target.

4,963,241

ELECTROLYTIC CELL WITH RECIRCULATION MEANS

Keith Brattan, Gt. Boughton, England, assignor to Imperial Chemical Industries PLC, Hertfordshire, England

Continuation of Ser. No. 7/062,688, Jun. 16, 1987, Pat. No. 4,832,804. This application Jan. 30, 1989, Ser. No. 303,137

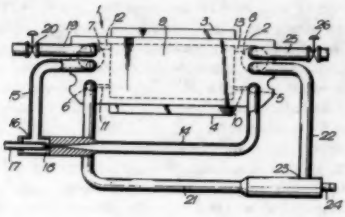
Claims priority, application United Kingdom, Jun. 17, 1986, 8614707

Int. Cl.[5] C25B *9/0015.08*

U.S. Cl. 204—237 8 Claims

1. An electrolytic cell which comprises at least one anode and at least one cathode, an inlet channel through which liquor may be charged to the electrolytic cell, and an outlet channel through which liquor may be removed from the electrolytic

cell, in which the outlet channel is operatively connected to the inlet channel, and in which the inlet channel comprises an ejector, and in which, in operation of the electrolytic cell,



liquor in the inlet channel which issues from the ejector acts upon the liquor in the outlet channel and causes recirculation of the liquor from the outlet channel back to the electrolytic cell via the inlet channel.

4,963,242

PLASMA ETCHING APPARATUS

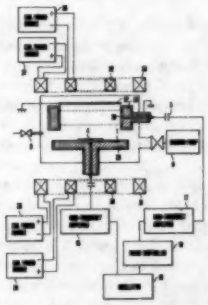
Masaaki Sato, and Yoshinobu Arita, both of Kanagawa, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed May 19, 1989, Ser. No. 354,906

Claims priority, application Japan, May 23, 1988, 63-123899; Nov. 16, 1988, 63-287570; Nov. 21, 1988, 63-292517; Apr. 3, 1989, 1-84544

Int. Cl.[5] C23F *1/02*

U.S. Cl. 204—298.31 **8 Claims**



1. A plasma etching apparatus comprising:

a first cathode electrode on which an object to be etched is placed;

an anode electrode arranged opposite to said first cathode electrode so as to be separated therefrom and connected to a constant potential source;

an annular second cathode electrode located between said first cathode electrode and said anode electrode and substantially surrounding said first cathode electrode in an insulated state;

magnetic field applying means for generating lines of magnetic force passing through said annular second cathode electrode substantially parallel to a surface of said first cathode electrode on which the object to be etched is placed; and

high-frequency power sources, respectively connected to said first and second cathode electrodes, for generating a plasma by gas discharge, thereby generating ions near said first and second cathode electrodes.

4,963,243

MEDIUM FOR ELECTROPHORESIS

Masashi Ogawa, Saitama; Hisashi Shiraishi, and Teppei Ikeda, both of Kanagawa, all of Japan, assignors to Director of The Finance Division Minister's Secretariat Science and Technology Agency, Tokyo, Japan

Continuation of Ser. No. 300,710, Jan. 23, 1989, abandoned, which is a continuation of Ser. No. 157,159, Feb. 16, 1988, abandoned, which is a continuation of Ser. No. 54,034, May 22, 1987, abandoned, which is a continuation of Ser. No. 805,575, Dec. 5, 1985, abandoned, which is a continuation of Ser. No. 568,748, Jan. 6, 1984, abandoned. This application Feb. 21, 1990, Ser. No. 483,317

Claims priority, application Japan, Jan. 8, 1983, 58-1323

Int. Cl.[5] B01K *5/00*

U.S. Cl. 204—299 R **10 Claims**

1. In a medium for electrophoresis comprising a polyacrylamide gel formed by crosslinking polymerization of an acrylamide compound and a crosslinking agent in the prsence of water and a compound containing at least one carbamoyl group as a modifier, the improvement which comprises the polyacrylamide gel containing a water-soluble polymer and agarose, said water-soluble polymer in the form of a polymer and agarose, being incorporated into the gel, the water-soluble polymer being present in an amount in the range of 2 to 50 wt. % based on the total weight of the acrylamide compound and crosslinking agent, and the amount of said agarose being in the range of 0.1 to 2 wt/v percent based on the volume of the polyacrylamide gel.

4,963,244

TEST CELL FOR IDENTIFYING DEACTIVATED SURFACE AREAS OF AN ELECTRODE

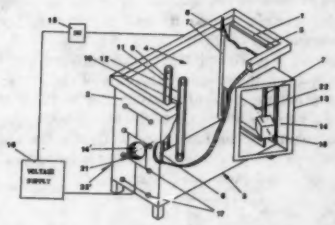
Stephan Kotowski, Seligenstadt; Bernd Busse, Darmstadt, and Bernd Donnerhak, Maintal, all of Fed. Rep. of Germany, assignors to Heraeus Elektroden GmbH, Hanau am Main, Fed. Rep. of Germany

Division of Ser. No. 403,671, Sep. 6, 1989, Pat. No. 4,919,766. This application Jan. 23, 1990, Ser. No. 468,540

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1988, 3837290

Int. Cl.[5] G01N *27/416*

U.S. Cl. 204—400 **1 Claim**



1. Electrolytic test cell for identifying deactivated surface areas of an activated surface layer of a flat electrode for electrochemical processes, said cell comprising:

an anode,

a cathode,

means for applying a voltage between said anode and said cathode,

holding means for holding said electrode to be tested between said anode and said cathode so that said activated surface layer faces said cathode,

a trough having transparent wall means to facilitate visually inspecting the activated surface layer of the electrode,

means for illuminating the activated surface layer of the electrode, and

a video camera directed toward the activated surface area.

4,963,245

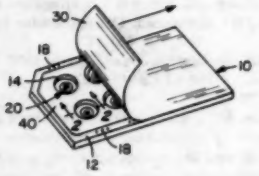
UNITARY MULTIPLE ELECTRODE SENSOR

Howard H. Weetall, Sharon, Mass., assignor to Ciba Corning Diagnostics Corp., Medfield, Mass.

Continuation of Ser. No. 859,128, May 2, 1986, abandoned. This application Mar. 9, 1990, Ser. No. 492,369

Int. Cl.[5] G01N *27/327*

U.S. Cl. 204—403 8 Claims



1. A method for performing an immunoassay of an analyte in a blood or a blood component test sample on a unitary electrochemical sensor, the method comprising:

(a) applying a test sample onto a unitary electrochemical sensor, said sensor comprising:

(i) a sensor support member including an electrically non-conductive surface; and

(ii) a plurality of wells deposited on the support member, wherein within each well is deposited an electrode array, the array defining an area on the support member for applying a test sample, the array consisting of a working electrode, a counter electrode and a reference electrode; and wherein the electrodes of the array are spaced from one another horizontally and vertically in said well, and wherein sensor activating chemicals are located on or attached to the working electrode of the array, the sensor activating chemicals comprising an electron transfer mediator, a first conjugate including a specific binding partner for the analyte to be measured, and a second conjugate including a known amount of the said analyte attached to an oxidizing catalyst or oxidizing substrate; and wherein the second conjugate is located on or attached to the working electrode of said array following the application of the test sample;

(b) applying an electron source onto the array on which said test sample was applied;

(c) applying a preselected potential between the working electrode and the counter electrode of the array;

(d) measuring the current between the working electrode and the counter electrode of the array; and

(e) determining the amount of the analyte in the test sample from the measurement of the current in step (d) relative to the preselected potential of step (c).

4,963,246

OXYGEN CONCENTRATION-SENSING DEVICE

Toyohei Nakajima; Toshiyuki Mieno; Yasuhiro Toyoda, and Haruo Horiuchi, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1988, Ser. No. 284,285

Claims priority, application Japan, Dec. 14, 1987, 62-316567; Dec. 14, 1987, 62-316568; Aug. 26, 1988, 63-212695

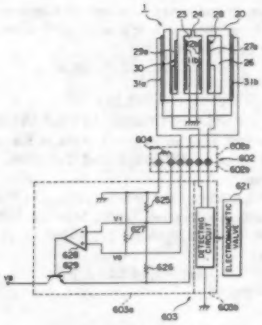
Int. Cl.[5] G01N *27/409*

U.S. Cl. 204—406 17 Claims

1. In an oxygen concentration-sensing device including an oxygen concentration-sensing element for sensing the concentration of oxygen contained in a gas, a heater for heating said element, supply means for supplying said heater with current for heating same, control mean electrically connected to said heater for controlling the operation of said supply means so as to bring the temperature of said heater to a desired temperature, and a coupler connecting said oxygen concentration-sensing element and said control means,

the improvement comprising a compensating resistance accommodated in said couplex and having a resistance value corresponding to a resistance value of said heater assumed at said desired temperature, and wherein said control means detects a resistance value of said heater only while said supply means is not operating, and then said control means controls the operation of said supply means based upon said detected resistance value of said heater and electrical information obtained from said compensating resistance.

15. In an oxygen concentration-sensing device including at least one oxygen concentration-sensing element formed by an oxygen-pumping element and a cell element, each of said oxygen-pumping element and said cell element composed of a member formed of a solid electrolytic material having oxygen



ion-conductivity, and a pair of electrodes having said member interposed therebetween, said oxygen-pumping element and said cell element defining a gas diffusion-limiting zone, a heater for heating said oxygen concentration-sensing element, and control means electrically connected to said heater for controlling the supply of electricity to said heater so as to bring the temperature of said heater to a desired temperature,

the improvement comprising a compensating resistance having a resistance value corresponding to a resistance value of said heater assumed at said desired temperature, and wherein said control means comprises a plurality of resistances, at least one of which is connected in parallel with said compensating resistance, said resistances forming a bridge circuit in cooperation with said heater, and potential balance-maintaining means for controlling the amount of electricity to be supplied to said heater and maintaining potential balance of said bridge circuit.

4,963,247

HYDROCRACKING OF HEAVY OIL IN PRESENCE OF ULTRAFINE IRON SULPHATE

Keith Belinko, Nepean; Chandra P. Khulbe, and Anil K. Jain, both of Oakville, all of Canada, assignors to Petro-Canada Inc., Mississauga, Canada

Filed Sep. 7, 1989, Ser. No. 403,861

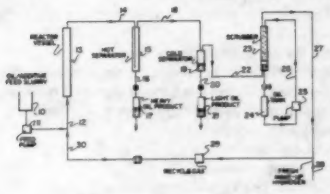
Claims priority, application Canada, Sep. 12, 1988, 577161

Int. Cl.[5] C10G *1/06, 47/02*

U.S. Cl. 208—112 9 Claims

1. In a hydroconversion process in which a feed slurry comprising a heavy hydrocarbon oil and an iron compound additive is contacted with a hydrogen-containing gas in a hydroconversion zone at hydrocracking conditions at a tem-

perature of 350°–600° C. and LHSV of 0.1 to 3.0 h^{-1} to convert at least a portion of said oil to lower boiling products,



the improvement which comprises utilizing as said additive a material consisting solely of an iron compound having particle sizes of less than 45 μm.

4,963,248

PROCESS FOR PRODUCTION OF DIMETHYLNAPHTHALENES

Kyoji Yano, and Shirou Aizawa, both of Okayama, Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1988, Ser. No. 249,160

Claims priority, application Japan, Sep. 24, 1987, 63-237428

Int. Cl.[5] C10G *35/04*; C07C *5/22*

U.S. Cl. 208—135 **9 Claims**

1. A process for producing dimethylnaphthalenes which comprises subjecting a raffinate resulting from the recovery of normal paraffins from a hydrodesulfurized kerosene fraction to reforming reaction and then recovering dimethylnaphthalenes from the product oil.

4,963,249

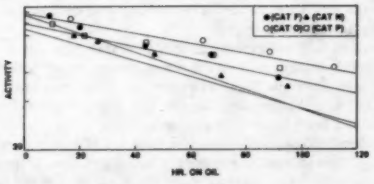
REFORMING USING NOVEL PLATINUM-TIN ALUMINA CATALYSTS

William C. Baird, Jr.; Kenneth L. Riley, and George A. Swan, III, all of Baton Rouge, La., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Jul. 3, 1989, Ser. No. 375,570

Int. Cl.[5] C10G *35/085*

U.S. Cl. 208—139 **8 Claims**



1. In a process for reforming, in the presence of hydrogen, a naphtha feed at reforming conditions, the improvement which comprises reacting said feed with a catalyst composition comprised of: 0.01 to 2 wt. % platinum; 0.01 to 2 wt. % tin; alumina; and a modifier comprised of at least about 100 wppm Si and at least about 10 wppm of one or more alkaline earth metals selected from the group consisting of Ca, Mg, Ba, and Sr, wherein the total amount of modifier does not exceed about 5000 wppm.

4,963,250

KEROGEN AGGLOMERATION PROCESS FOR OIL SHALE BENEFICIATION USING ORGANIC LIQUID IN PRECOMMUNICATION STEP

Bernard Y. C. So, Wheaton, and Terry L. Marker, Lisle, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Nov. 9, 1989, Ser. No. 434,707

Int. Cl.[5] C10G *1/00*

U.S. Cl. 208—426 **24 Claims**

1. A kerogen agglomeration method for beneficiating oil shale, comprising the steps of:

(a) comminuting a substantial portion of the oil shale to a top size of about 0.4–0.003 inch in the presence of an added liquid consisting essentially of an organic liquid;

(b) contacting said oil shale with a multiphase liquid comprising an added organic liquid and water to form kerogen-rich agglomerates and mineral-rich particles; and

(c) separating the kerogen-rich agglomerates from the mineral-rich particles.

4,963,251

APPARATUS FOR SORTING AND DISTRIBUTING MAIL PIECES

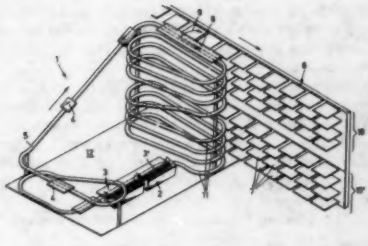
Günter Böhm, Bonn; Jürgen Schieleit, Dortmund; Detlev Braun, Hattingen; Heinz-Georg Pater, Ense-Vierhausen; Heinz Köbbing, Dortmund, and Hubert Büchter, Ahlen, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Förderung der Angewandten Forschung e.V.

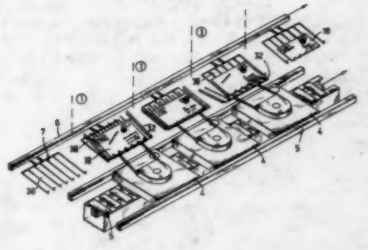
Filed Sep. 15, 1988, Ser. No. 245,128

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1987, 3731589

Int. Cl.[5] B07C *3/08*

U.S. Cl. 209—564 **22 Claims**





1. Apparatus for sorting mail pieces, such as letters and similar mailing pieces of different sizes and thicknesses forwarded as letter mail, for forming accurate mail piece stacks, comprising:

(a) an input module comprising an individual mail piece conveyor and a separating station, a circulating endless transporter conveyor, said individual mail piece conveyor

moves past a plurality of spaced tiers of said transporter conveyor, said tiers of said transporter conveyor each comprising a number of individual receptacles,

(b) first means on said individual mail piece conveyor for transferring mail pieces from said individual mail piece conveyor into individual receptacles of said transporter conveyor, said first means comprises a plurality of fork-type transporting pallets, said individual receptacles comprise forked baskets, and

(c) second means, on an output module, for extracting mail pieces from said receptacles and stacking the mail pieces in containers on said output module.

4,963,252

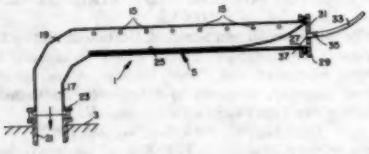
DECANTER DEVICE

Gaétan Desjardins, 8170 Yves Prévost, Ville d'Anjou, Quebec, Canada

Filed Dec. 28, 1989, Ser. No. 458,449

Int. Cl.[5] B01D *21/24*

U.S. Cl. 210—172 **7 Claims**



1. A decanter device for use to withdraw supernatant liquid from a tank containing a mixture of liquids of different densities or liquid and solid particles to be separated, said device comprises:

a perforated pipe mounted inside the tank, said pipe comprising a plurality of inlets in the form of small orifices positioned along said pipe and opening into the tank, and at least one outlet leading out of said tank;

an inflatable membrane mounted inside the pipe in such a manner as to extend over said small orifices and sealingly close the inlets of said pipe when said membrane is inflated, and to extend away from said small orifices and away from said at least one outlet to allow supernatant liquid to flow out of the tank through said this pipe when the membrane is not inflated; and

means for inflating the membrane whenever desired.

4,963,253

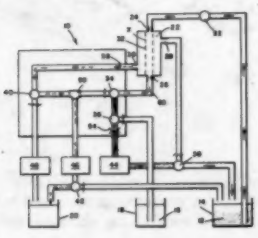
ANTI-CLOGGING AND DIALYSIS DEVICE FOR FILTRATION SYSTEMS

Richard C. K. Yen, 4261 Chase Ave., Los Angeles, Calif. 90066

Filed Jan. 3, 1989, Ser. No. 292,991

Int. Cl.[5] B01D *61/28, 63/06, 63/08, 65/08*

U.S. Cl. 210—195.2 **4 Claims**



1. An apparatus for filtering and dialyzing a suspension and increasing the concentration of retainable matter, comprising:

(a) a suspension holding means;

(b) a suspension including particulate matter retained within said suspension holding means;

(c) a dialysis buffer holding means;

(d) a dialysis buffer retained within said dialysis buffer holding means;

(e) means for capturing filtrate;

(f) a filter means further comprising a housing having an inlet port, an exit port, a pair of sidewall openings, and a filter membrane within the housing;

(g) a first pump means;

(h) a second pump means;

(i) a third pump means;

(j) an interchangeable valve means;

(k) means for interconnecting said first pump means, said second pump means, said third pump means and said interchangeable valve means to said filter means, to said suspension holding means, to said dialysis buffer holding means and to said means for capturing filtrate;

(l) said first pump means, said second pump means and said third pump each functionally located downstream from said filter means when used for re-circulating suspension or extraction of filtrate from the fluid phase of the suspension;

(m) said interchangeable valve means having a first setting wherein said first pump means causes said suspension to be drawn out of said suspension holding means and run through said filter means and recirculated back into the suspension holding means while said second pump means causes filtrate from the fluid phase of the suspension which has passed through said filter membrane to be drawn through one of said pair of sidewall openings in the filter housing and directed to said means for capturing filtrate;

(n) when said interchangeable valve means is set at the first setting, said first pump means set to cause suspension flow at a rate sufficiently greater than the filtrate flow from the second pump means so that negative pressure away from the filter membrane generated on the recirculating suspension by said first pump means is greater than the positive pressure applied onto the filter membrane generated by the second pump means on said filtrate;

(o) said interchangeable valve means having a second setting wherein said second pump means causes said suspension to be drawn out of said suspension holding means and run through said filter means and recirculated back into the suspension holding means while said first pump means causes dialysis buffer to be drawn out of said dialysis buffer means and run through one of said pair of openings in the sidewall of the filter housing and through the filter membrane while said third pump means causes dialysis buffer which has passed through the filter membrane and the dialysis buffer in the filter housing to be removed from the filter means through the other of said pair of openings in the sidewall of the filter housing and directed to said filtrate capturing means;

(p) when said interchangeable valve means is set at said second setting, said third pump means is set to extract filtrate from the fluid phase of the suspension at a rate equal to the rate at which the first pump means delivers dialysis fluid to the filter means;

(q) when said second pump means is set at said second setting, said second pump means is set to cause suspension flow sufficiently greater than the flow of dialysis buffer from said first pump and extraction rate of filtrates by the third pump so that negative pressure away from the filter membrane generated on the recirculating suspension by said second pump means is greater than the positive pressure against the filter membrane generated by the third pump means;

(r) said interchangeable valve means having a third setting identical to the setting set forth in element (o);

(s) when said interchangeable valve means is set at said third setting, said third pump means is set to extract filtrate from

the fluid phase of the suspension at a rate greater than the rate at which the first pump means delivers dialysis fluid to the filter means; and

(t) when said interchangeable valve means is set at said third setting, said second pump means is set to cause suspension flow sufficiently greater than the difference between the flow of dialysis buffer from said first pump and extraction rate of filtrates by the third pump so that negative pressure away from the filter membrane generated on the recirculating suspension by said second pump means is greater than the positive pressure against the filter membrane generated by the third pump means;

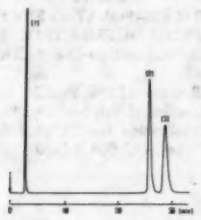
(u) whereby the greater negative pressure generated by the downstream pump means on the suspension causes the particulate matter in the suspension to be drawn away from the filter membrane and thereby prevents clogging of the filter membrane.

4,963,254

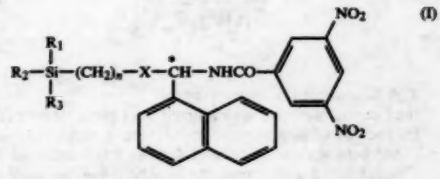
PACKING MATERIAL FOR CHROMATOGRAPHIC USE

Naobumi Oi, Kyoto; Hajimu Kitahara, and Tadashi Doi, both of Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited and Sumika Chemical Analysis Service, both of Osaka, Japan

Filed Jul. 14, 1988, Ser. No. 218,788
Claims priority, application Japan, Jul. 15, 1987, 62-177983
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 **1 Claim**



1. A chromatographic column comprising a column packed with a packing material sized and dimensioned for chromatographic use, said packing material comprising an inorganic carrier having hydroxyl groups on the surface thereof, having grafted thereon an organosilane of formula (I):



(I)

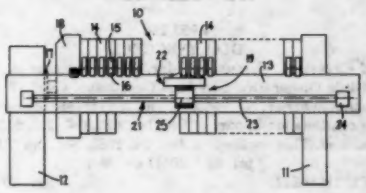
wherein R_1, R_2 and R_3, which may be the same or different, each represents an alkyl, alkoxy or hydroxyl group or a halogen atom, provided that at least one of them represents an alkoxy group or a halogen atom; X represents an —NHCO— or —$NH_3^{\pm}$OCO— group; n is an integer of 2 to 4; and *C represents an asymmetric carbon atom.

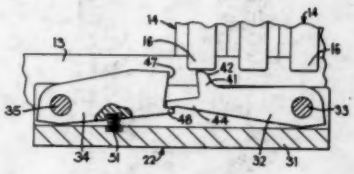
4,963,255

PLATE SHIFTER FOR FILTER PRESS

Daniel DeHaan, Zeeland Township, Ottawa County; Michael J. Brinks, Heath Township, Allegan County, and Sherwood Steketee, Saugatcuk Township, Allegan County, all of Mich., assignors to JWI, Inc., Holland, Mich.

Filed Jun. 2, 1989, Ser. No. 360,549
Int. Cl.[5] B01D *25/172*
U.S. Cl. 210—230 **6 Claims**





1. In a filter press having an elongate frame, a first press head plate mounted on said frame adjacent one end thereof, a second press head plate slidably mounted on said frame adjacent the other end thereof, s a plurality of filter plates slidably supported on said frame between said first and second press head plates, a drive for moving said second press head plate longitudinally along said frame between a first closed position wherein the plurality of filter plates are snugly horizontally stacked between the press head plates and an open position wherein the second press head plate is spaced sufficiently from the first press head plate to permit slidable displacement of the individual filter plates longitudinally along the frame, and a shifter apparatus for engaging and effecting slidable shifting of individual filter plates longitudinally along said frame, said shifting apparatus including a shifting mechanism disposed for generally linear movement back and forth along the frame in the longitudinal direction thereof and a driving unit connected to said shifting mechanism for causing said linear back and forth movement, the improvement wherein said shifting mechanism comprises:

a carrier supported for said linear back and forth movement;

a first pawl pivotally mounted on said carrier and defining thereon a first upwardly facing stop, said first pawl being swingable between raised and lowered positions;

spring means coacting with said first pawl for normally urging said first pawl toward said raised position;

a second pawl pivotally mounted on said carrier and being swingable between raised and lowered positions, said second pawl defining thereon a second downwardly-facing stop which is disposed generally vertically above said first upwardly-facing stop, said second pawl being freely pivotally supported on said carrier free of biasing springs;

said first pawl defining thereon a first abutment surface for abuttingly contacting one side of a said filter plate, said second pawl defining thereon a second abutment surface for abuttingly contacting an opposite side of aid filter plate, said fist and second abutment surfaces being disposed in generally longitudinally spaced but opposed relation to one another; and

said second pawl having a cam part formed thereon and projecting upwardly therefrom, said cam part defining said second abutment surface on one side thereof and defining camming surface on the other side thereof, said first and second pawls projecting horizontally toward one another and terminating in free ends which are disposed in close proximity to one another and which have said abutment surfaces formed thereon, each of said first and second pawls having a lug which projects outwardly at the free end thereof beyond the respective abutment surface.

4,963,256

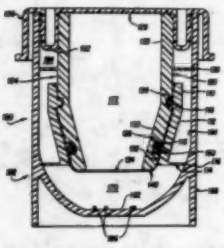
DIALYSIS CELL

Jerald C. Nelson, Corona del Mar, Calif., assignor to Nichols Institute Diagnostics, San Juan Capistrano, Calif.

Continuation of Ser. No. 750,670, Jul. 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 627,894, Jul. 5, 1984, abandoned. This application Jun. 24, 1988, Ser. No. 210,859

Int. Cl.[5] B01D *61/28*

U.S. Cl. 210—232 **19 Claims**



1. A dialysis cell, comprising:

a vial for containing a first fluid, and having an open end portion;

a first hollow member for containing a second fluid and insertable into said open end portion of said vial, said first hollow member having a first opening at one end portion to permit open communication between the interior of the hollow member and the ambient atmosphere to allow equilibration with ambient gases, the other end portion of said hollow member having a conical shape terminating in a second opening;

a second hollow member having a conically shaped portion complementary to the conically shaped end portion of said first member, the inner diameter of said second member being greater than the other diameter of the conically shaped portion of said first member;

dialysis membrane means disposed over the second opening in said first member and extending and sandwiched between the outer surface of the conically shaped portion of said first member and the inner surface of the conically shaped portion of said second member; and

sealing means disposed between said first and second members for compressing the membrane and molding to microchannels formed in said membrane to thereby form a fluid tight seal between the membrane and said first and second members.

4,963,257

BUOYANT COARSE MEDIA FLOCCULATOR

Christopher R. Schulz, 46 Ancell St., Alexandria, Va. 22305

Continuation-in-part of Ser. No. 173,611, Mar. 25, 1988, Pat. No. 4,865,734. This application Sep. 11, 1989, Ser. No. 405,213

Int. Cl.[5] C02F *1/52*

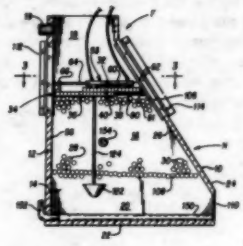
U.S. Cl. 210—279 **13 Claims**

1. In a flocculator apparatus having a housing including two opposite walls with one said wall disposed at an upwardly and inwardly inclined angle to define an interior flocculator chamber constructed and arranged to form a continuously decreasing horizontal cross-sectional area from a lowermost effluent zone to an uppermost influent zone, and a media bed within said chamber comprising buoyant coarse media, the improvement comprising;

a restrainer mechanism overlying said media bed,

said restrainer mechanism including a plurality of gratings,

means vertically interlocking said gratings relative one another while allowing relative horizontal displacement therebetween, and



shifting means engageable with said restrainer mechanism and operable to horizontally displace one of said gratings relative another one of said gratings and simultaneously vertically displace said restrainer mechanism within said flocculator chamber, wherein

displacement of said gratings alters the cross-sectional area defined by said gratings as well as the horizontal and vertical extent of said media bed.

4,963,258

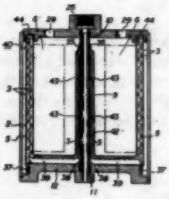
FILTER WITH PERFORATED FIN PORTIONS EXTENDING FROM OUTER CYLINDRICAL WALL

Aisaburo Yagishita, 5-2, Shinpo-Cho 4-Chome, Chikusa-Ku, Nagoya, Japan

Continuation of Ser. No. 17,900, Feb. 24, 1987, abandoned, which is a continuation of Ser. No. 550,090, Nov. 9, 1983, abandoned. This application Jan. 27, 1988, Ser. No. 148,967

Int. Cl.[5] B01D *29/07*

U.S. Cl. 210—315 **5 Claims**



1. A filter assembly, comprising:

(a) a casing provided with a liquid inlet and a liquid outlet;

(b) a semiflexible, perforated core arranged within the casing and between the liquid inlet and the liquid outlet so that liquid which passes from the inlet to the outlet must pass through the core at least once, said core including a perforated outer cylindrical wall, a perforated inner cylindrical wall, a perforated annular bottom wall connected with and extending between the lower ends of the outer cylindrical wall and the inner cylindrical wall, and a plurality of perforated fin portions connected with and extending

radially inward from the outer cylindrical wall toward the inner cylindrical wall; and

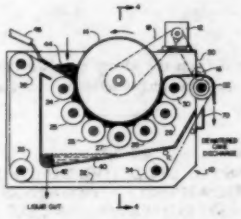
(c) a filter cloth covering the surfaces of said core so that liquid which passes from the inlet to the outlet must pass through the filter cloth at least once.

4,963,259

SLUDGE DEWATERING FILTER PRESS

Lyle B. Barcomb, North Syracuse, and Lawrence El-Hindi, Syracuse, both of N.Y., assignors to Filter Tech Inc., Manlius, N.Y.

Filed Apr. 17, 1989, Ser. No. 338,882
Int. Cl.[5] B30B *9/24*
U.S. Cl. 210—386 10 Claims



1. A mechanical, continuous-process sludge dewatering system comprising:

(a) an endless, liquid-permeable belt;

(b) first roller means including a plurality of individual rollers supported for rotation about spaced, parallel axes about which the respective external surfaces of said individual rollers are symmetrically arranged;

(c) second roller means comprising a single, cylindrical drum of constant diameter supported for rotation about an axis parallel to said axes of said first roller means;

(d) at least a predetermined group of said plurality of individual rollers having external surfaces which taper inwardly, toward the roller axis from equal diameters at each end to central portions of lesser diameter than said equal diameters, said lesser diameter being least for a first roller of said predetermined group and being greater for at least some successive rollers of said predetermined group, but not greater than said equal diameters, all of said equal diameters being smaller than said constant diameter of said drum;

(e) said liquid-permeable belt passing between said predetermined group of rollers and said second roller means wherein lateral edge portions of said belt are firmly engaged between opposing, external surfaces of each of said predetermined group of rollers and said second roller means;

(f) means for imparting rotation at a predetermined rate to said belt and to said first and second roller means; and

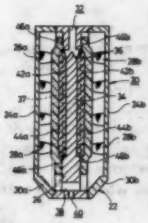
(g) means for depositing water-laden sludge on an upper surface of said endless belt for passage therewith between said predetermined group of rollers and said second roller means, whereby said sludge is compressed to successively smaller volumes, thereby forcing water from said sludge and through said belt.

4,963,260

LIQUID FILTERING DEVICE

Keiji Naoi; Katsuhiko Iwata, and Osamu Kaneko, all of Fuji, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1989, Ser. No. 321,650
Claims priority, application Japan, Mar. 15, 1988, 63-60912
Int. Cl.[5] B01D *29/56*
U.S. Cl. 210—446 8 Claims



1. A liquid filtering device comprising:

a housing having a liquid inlet port and a liquid outlet port;

a partition plate fixedly disposed in said housing;

a first filter element disposed in said housing; and

a second filter element disposed in said housing in a position downstream of said first filter element with respect to a direction in which a liquid to be filtered flows from said liquid inlet port to said liquid outlet port, said second filter element being made of a material having a larger filtration resistance than said first filter element, said second filter element having an outer peripheral edge fixed directly to said partition plate in a liquidtight manner in surrounding relation to said first filter element.

4,963,261

MICROPOROUS MEMBRANE HAVING A MACROPOROUS SUPPORT

Gregory Witkowski, Greenpoint; Bandad Bahar, New York, and Irving M. Wolbrom, Great Neck, all of N.Y., assignors to Chromex Corp., Brooklyn, N.Y.

Filed Aug. 28, 1989, Ser. No. 399,603
Int. Cl.[5] B01D *69/12*
U.S. Cl. 210—490 12 Claims

1. A porous structure comprising

a macroporous support, and

a microporous membrane in contact with an outside surface of the support,

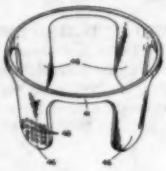
the structure being formed by placing a preexisting membrane in contact with a quantity of discrete polymer particles, and heat fusing the particles together to form the support, the membrane remaining in contact with the particles while the latter are fused together.

4,963,262

COFFEE FILTER PAPER RETAINER

Edna M. Johnstone, 3765 E. Smith Rd., Bellingham, Wash. 98226

Filed Apr. 21, 1989, Ser. No. 341,935
Int. Cl.[5] B01D *29/07*
U.S. Cl. 210—474 **1 Claim**



1. A coffee filter paper retainer adapted to be used with an automatic drip coffee maker; wherein said coffee maker is for brewing a quantity of brewed coffee; wherein said coffee maker comprises a coffee basket, a coffee filter paper in said coffee basket for holding a quantity of coffee grounds, and a coffee pot for holding said quantity of brewed coffee after it has been brewed by said coffee maker; wherein said coffee filter paper has a bottom and a sidewall extending upwardly from said bottom; and wherein said coffee filter paper retainer comprises:

a retaining member means; and

at least one leg means extending downwardly from said retaining member means;

wherein said retaining member means and said leg means are sized and shaped to be adapted to fit within said coffee filter paper in said coffee basket; wherein, during use of said coffee filter paper retainer, at least a portion of said sidewall of said coffee filter paper is sandwiched between said coffee basket and at least one of said retaining member means and said leg means; wherein , during use of said coffee maker to make coffee, at least one of said retaining member means and said leg means are for preventing said sidewall of said coffee filter paper from doping to the point where said coffee grounds spill over said sidewall of said coffee filter paper and into said brewed coffee in said coffee pot; and wherein at least one of said leg means is perforated, to permit said brewed coffee to pass through said at least one of said leg means to said coffee filter paper.

4,963,263

METHOD OF IDENTITY ANALYTE-BINDING PEPTIDES

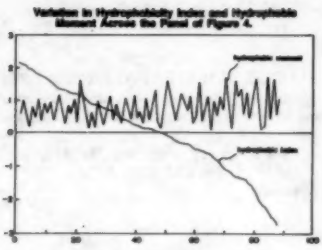
Lawrence M. Kauvar, San Francisco, Calif., assignor to Terrapin Technologies, Inc., San Francisco, Calif.

Continuation of Ser. No. 172,626, Mar. 24, 1988, abandoned. This application May 16, 1989, Ser. No. 355,042
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—635 **7 Claims**

1. A method to identify a peptide having a sequence of 4–20 amino acids useful for the conduct of affinity chromatography with respect to an analyte,

wherein said peptide has specific affinity for said analyte, which method comprises:

screening, for ability to bind said analyte, a panel of individual candidate peptides wherein said candidate peptides have systematically varied values of at least two parameters selected from the group consisting of hydrophobic index, amphipathic characteristics, and charge pattern.

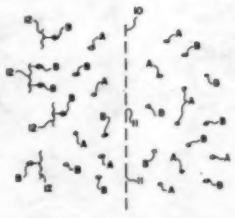


4,963,264

PROCESS FOR SELECTIVE DIALYSIS USING POLYMERIC AFFINITY ADSORBENTS AND SIZE SELECTIVE MEMBRANES

James C. Davis, Hudson, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 10, 1985, Ser. No. 742,872
Int. Cl.[5] B01D *61/26*
U.S. Cl. 210—638 **18 Claims**



1. A process for the selective dialysis of liquid streams containing different materials comprising the steps of:

providing a porous membrane in a cell, said membrane having pores of sufficient dimension to allow passage of said different materials therethrough, wherein said different materials are selected from the group consisting of calcium, sodium, copper, iron, potassium chromate, sodium chloride, reduced nicotinamide adenine dinucleotide and zinc;

circulating an affinity adsorbent stream miscible with said liquid stream against a first side of said membrane, said affinity adsorbent having a dimension large than that of said pores and having a preferred binding capacity for at least one but not all of said different materials and wherein said affinity adsorbent is selected from the group consisting of alcohol dehydrogenase, polyethylenimine, poly(2-acrylamido-2-methylpropanesulfonic acid) and ground ion exchange resin; and

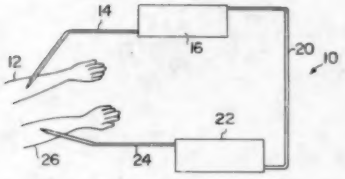
passing said liquid stream containing said different materials against a second side of said membrane whereby certain of said materials become bound to said affinity adsorbent upon passing through said membrane to said first side in a concentration greater than their concentration in said liquid stream and thereby become separated from others of said materials which can return to said second side of said membrane.

4,963,265

PLASMA PROCESSING DEVICE WITH ANAPHYLATOXIN REMOVER

Thomas B. Okarma, Palo Alto; Brian R. Clark, Redwood City; L. Bernard Lerch, Menlo Park, and Chin-Hai Chang, Los Altos, all of Calif., assignors to Applied ImmuneSciences, Inc., Menlo Park, Calif.

Filed May 6, 1988, Ser. No. 191,039
Int. Cl.[5] B01D *39/00, 61/58, 15/08*
U.S. Cl. 210—638 **8 Claims**



1. A method for reducing elevated levels of anaphylatoxins in a blood derived fluid consisting of serum or plasma having an initial level of at least one of the anaphylatoxins at least two times greater than the original blood level of anaphylatoxins comprising:

contacting said fluid with an anaphylatoxin reducing amount of silicic acid.

4,963,266

COMPOSITION AND PROCESS FOR SEPARATING FLUID MIXTURES

Charles R. Morgan, Brookeville; Cheng-Chi Chen, Columbia; Thomas A. Blinka, Glen Burnie, and Alan S. Obligin, Catonsville, all of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Division of Ser. No. 266,617, Nov. 3, 1988, Pat. No. 4,882,057. This application Oct. 13, 1989, Ser. No. 405,994
Int. Cl.[5] B01D *61/00, 63/02, 69/04*
U.S. Cl. 210—640 **25 Claims**

1. A process for separating fluids that comprises bringing a mixture of two or more fluids into contact with a membrane comprising as a film of up to about 1,000 microns thick or a hollow fiber a polyaromatic polymer including aromatic repeat units of which at least 5 mole percent are substituted by moieties having ethylenically unsaturated carbon bonds wherein the polymer is crosslinked by carbon bonds through ethylenically unsaturated moieties and has improved properties of durability sufficient for enabling said membrane to effectively perform in processes selected from the group consisting of natural gas purification, hydrogen recoveries, syngas processes, separation of carbon dioxide or hydrogen sulfide from hydrocarbons, and enrichment of oxygen and nitrogen from air streams.

7. A process for making a polymeric film useful as a semipermeable fluid separation membrane that comprises:

casting a solution of a polymer in a solvent wherein the polymer includes aromatic repeat units of which at least 5 mole percent are substituted by moieties having ethylenically unsaturated carbon bonds, and

crosslinking the polymer by forming carbon bonds between at least some of the moieties having ethylenically unsaturated carbon bonds before complete solvent removal from the solution while the solution essentially is still fluid to produce a membrane having improved properties of durability sufficient when used in processes selected from the group consisting of natural gas purification, hydrogen recoveries, syngas processes, separation of carbon dioxide or hydrogen sulfide from hydrocarbons, and enrichment of oxygen and nitrogen from air streams.

14. A process for making an asymmetric semipermeable fluid separation membrane that comprises

forming a polymer solution in a solvent wherein the polymer includes aromatic repeat units of which at least 5 mole percent are substituted by moieties having ethylenically unsaturated carbon bonds;

casting a thin film of the polymer solution; and

gelling the polymer solution in non-solvent for the polymer to produce a membrane having improved properties of durability sufficient when used in processes selected from the group consisting of natural gas purification, hydrogen recoveries, syngas processes, separation of carbon dioxide or hydrogen sulfide from hydrocarbons, and enrichment of oxygen and nitrogen from air streams.

4,963,267

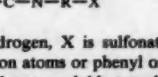
STABILIZATION OF MANGANESE IN AQUEOUS SYSTEMS

John E. Hoots, St. Charles; Kenneth P. Fivizzani, Naperville, and Barbara E. Fair, Downers Grove, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation of Ser. No. 256,555, Oct. 12, 1980, abandoned. This application Mar. 26, 1990, Ser. No. 501,438
Int. Cl.[5] C02F *5/12*
U.S. Cl. 210—701 **15 Claims**

1. A method of stabilizing manganese in the waters of an aqueous system to at least diminish the formation of manganese deposits caused by oxidative condition(s) of said waters which method comprises:

the addition to the waters of said aqueous system an effective amount of a water-soluble terpolymer comprised of from about 20 to about 75 mole percent of acrylic acid units, from about 10 to about 60 mole percent a acrylamide units, and from about 5 to about 70 mole percent of N-substituted acrylamide units having pendant amide functionality of the Formula I:



Formula I

wherein R_1 is hydrogen, X is sulfonate, and R is alkylene having 1 to 3 carbon atoms or phenyl or mixtures thereof,

and wherein said water-soluble terpolymer has a molecular weight of from about 5,000 to about 50,000.

4,963,268

METHOD AND SYSTEM FOR VARIABLE FREQUENCY ELECTROMAGNETIC WATER TREATMENT

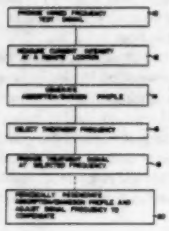
Dwain Morse, Santa Barbara, Calif., assignor to Aqua Dynamics Group Corp., Wilmington, Del.

Continuation-in-part of Ser. No. 183,919, Apr. 20, 1988, Pat. No. 4,865,748. This application Feb. 21, 1989, Ser. No. 312,225
The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.
Int. Cl.[5] B01D *17/06;* **C02F** *1/48*
U.S. Cl. 210—739 **12 Claims**

1. An electromagnetic treatment for a liquid contained in a system, said method comprising the steps of:

(a) generating an electromagnetic signal at a frequency preselected in response to the energy absorption/emission profile of said liquid; and

(b) directing said electromagnetic signal into the liquid contained within the system at a preselected location, through



a non-insulated conductor in electrical contact with the liquid.

4,963,269

WATER OZONIZATION METHOD

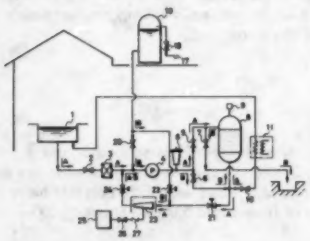
Toshihiko Sasaki, and Hatsuo Yotsumoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 138,190, Dec. 28, 1987, Pat. No. 4,906,358. This application Jan. 30, 1990, Ser. No. 472,545

Claims priority, application Japan, Dec. 26, 1986, 61-203261[U]

Int. Cl.[5] C02F *1/78*

U.S. Cl. 210—760 **2 Claims**



1. A method of ozonizing water in a water system which includes a main water line through which water is circulated, a pump for pumping said water through said main water line, and a filter for filtering said water by passing said water through said filter in a first direction, comprising the steps of:

diverging a portion of said water from a discharge side of said pump into a diverging pipe;

injecting ozone with an ejector into said diverged water in said diverging pipe to thereby form ozonous water and ozonizing gas therein, and

returning said ozonous water and ozonizing gas to said main water line via said diverging pipe to a suction side of said pump, wherein the amount of ozone injected is limited such that the amount of ozonizing gas resulting therefrom produces no cavitation to said pump so as to increase ozone absorption efficiency thereby accelerating the reaction of the unreacted ozonizing gas in said pump with the water in said pump.

4,963,270

DECKER WITH PARTITIONS FOR FILTRATE FRACTIONS

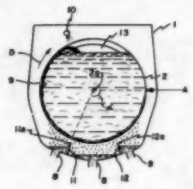
Erkki Turkia, Inkeroinen, and Jouko Hautala, Tampere, both of Finland, assignors to Oy Tampella Ab, Tampere, Finland

Filed Apr. 28, 1989, Ser. No. 344,569

Claims priority, application Finland, Apr. 28, 1988, 881994

Int. Cl.[5] C02F *11/12*

U.S. Cl. 210—770 **20 Claims**



11. A method for separating filtrate from a mass to be thickened, comprising the steps of:

feeding the mass to be thickened to the inside of a thickening drum rotating within a tank;

causing the filtrate separated from the mass to flow from the inside of the drum, through a drum filtering shell, rotating together with the drum to the bottom portion of the tank;

effecting deposition of a layer formed of solids separated from said mass on the inner surface of said filtering shell in such a fashion that the thickness of said layer at a predetermined angular distance from the horizontal plane coincides with the axis of rotation of the drum and consequently the purity of the filtrate filtered through said shell at said distance is proportional to the amount of said angular distance;

continuously removing said layer from the inner surface of said filtering shell into the mass inside the drum at a predetermined distance from said horizontal plane;

separating the filtrate into at least two filtrate fractions using separating means positioned in the bottom portion of the tank outside the drum, in such a fashion, that said means form a partition point or line situated transversely to the direction of rotation of the drum and situated in the direction of rotation of the drum at a predetermined angular distance from said horizontal plane coinciding with the axis of rotation of the drum, thus separating the filtrate flowing through the shell before and after said angular distance into two filtrate fractions; and

continuously withdrawing said filtrate fractions from the decker, through means provided in the bottom of the tank for each fraction at a substantially constant solids content differing from that of the other fraction.

4,963,271

PROCESS FOR THE SEPARATION AND PURIFICATION OF CELLULOSE ETHERS AND CELLULOSE DERIVATIVES

Wilfried Raehse, Duesseldorf; Willi Wuest, Ratingen, and Norbert Knehne, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 31, 1988, Ser. No. 238,687

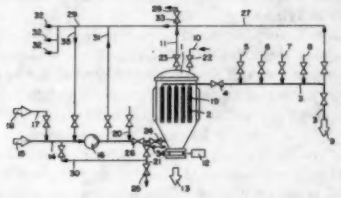
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729268

Int. Cl.[5] B01D *37/04*

U.S. Cl. 210—772 **15 Claims**

1. A process for the separation and purification of cellulose, cellulose ethers or cellulose derivatives in a pressure vessel equipped with candle filters, comprising feeding a suspension of cellulose, cellulose ethers and thermoplastic cellulose to said pressure vessel, introducing steam or gas pressure to the pressure vessel to form a filter cake of said suspension onto said

candle filters, conducting the filtrate obtained at said candle filters out of said pressure vessel into a filtrate pipe, removing the residual mother liquor from said pressure vessel, feeding a washing liquid to said pressure vessel, introducing steam or gas pressure to the pressure vessel to remove said washing liquid



from the pressure vessel and said filter cake, conducting the filtrate obtained into said filtrate pipe, removing said filter cake from said candle filters by introducing steam or gas on the filtrate pipe side, and recovering said filter cake from said pressure vessel.

4,963,272

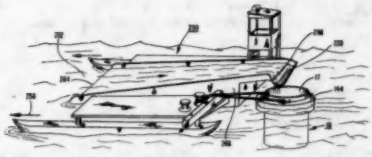
APPARATUS AND METHOD FOR CONCENTRATING MATERIALS

Joseph B. Garrett, 198 Sagamore Rd., Millburn, N.J. 07041

Filed Apr. 26, 1989, Ser. No. 343,800

Int. Cl.[5] E02B *15/04*

U.S. Cl. 210—776 **12 Claims**



1. A method of cleaning up an oil spill which forms a layer overlaying the surface of a body of water, which method comprises the steps of:

moving a skimming means in a preselected direction along the surface of the body of water to collect a mixture of said layer and water from said surface, the skimming means comprising:

a flat surface having a leading edge;

an outlet from the flat surface;

means to buoy the skimmer in a mixture of said layer and water wherein the flat surface is at an acute angle to the surface of the mixture;

means to control the level of the leading edge beneath the surface of the mixture; and

means to propel the skimmer through the mixture;

juxtaposing to said skimming means at least one tank in a floating relation to said surface of the mixture with an upper edge protruding from said surface, said tank comprising a top opening, a laterally-extending sidewall having a lower edge which substantially defines a bottom opening, a compartment which extends down into said body of water to an internal depth and substantially exceeds the depth of said layer, the top opening being positioned to receive the mixture from the skimmer outlet; and

continuously directing a flow of said mixture from said skimmer into said tank in said internal depth direction during a process in which said compartment fills with an oil concentrate formed from said mixture, with a corresponding amount of water being expelled from said tank through said bottom opening during said process.

4,963,273

MODIFIED NON-POLLUTING LIQUID PHASE SHALE SWELLING INHIBITION DRILLING FLUID AND METHOD OF USING SAME

Alphonse C. Perricone; Dennis K. Clapper, and Dorothy P. Enright, all of Houston, Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation of Ser. No. 128,798, Dec. 4, 1987, Pat. No. 4,830,765. This application Sep. 16, 1988, Ser. No. 245,267

The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.

Int. Cl.[5] C09K *7/02*

U.S. Cl. 252—8.51 **2 Claims**

1. A method of inhibiting the swelling of shale in a modified non-polluting liquid phase drilling fluid, comprising the steps of:

(1) preparing a non-polluting modified liquid phase drilling fluid consisting essentially of:

(a) a water phase comprising fresh water, sea water, brine, simulated brine, or mixtures thereof;

(b) a water soluble component selected from the class consisting of glycol ethers, polypropylene glycols, polyethylene glycols, ethylene oxide-propylene oxide copolymers, alcohol-initiated ethylene oxide-propylene oxide copolymers and/or mixtures thereof, the ratio of said water-soluble component to the total liquid phase being from between at least about 20% to about 50% by volume;

(c) a viscosifier for a suspension of solids in said liquid phase; and

(d) a filtration control agent, the linear swelling of said drilling fluid on a reconstituted "gumbo" shale inserted for about 60 minutes in said drilling fluid being lower than that for substantially the same fluid without the water soluble component, as measured by the "Swelling Test", "Rigsite Shale Evaluation Techniques for Control of Shale-Related Wellbore Instability Problems", SPE/IADE Paper No. 16054, Pages 52–53 (1987); and

(2) circulating said drilling fluid into, through and out of said subterranean well whereby said drilling fluid contacts formation particulate matter in the bore of said well.

4,963,274

CONCENTRATED FABRIC CONDITIONERS

Wulf Ruback, Recklinghausen; Jan Schut, Niederlande; Werner Friedrich, Herten; Heinz Riemer, Bottrop, and Hauke Steinhardt, Herne, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jun. 8, 1988, Ser. No. 203,999

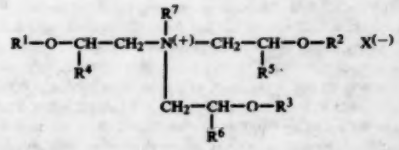
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720331

Int. Cl.[5] C11D *7/32, 7/34, 7/36*

U.S. Cl. 252—8.75 **15 Claims**

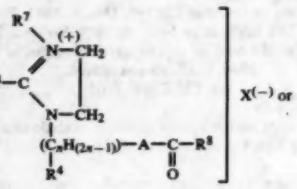
1. A fabric conditioner mixture, comprising:

(a) 18–50% by weight of a mixture of at least two conditioner components (A) and (B), said mixture comprised of 10 to 90% by weight of a compound of the formula (A):



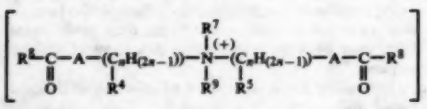
wherein R^1, R^2 and R^3, independently of one other are each a linear, saturated or unsaturated acyl radical having 8 to 24 carbon atoms, or hydrogen, with the proviso that one of R^1, R^2 and R^3 is hydrogen and two of the groups R^1, R^2 and R^3 must be acyl; R^4, R^5 and R^6, independently of each other, are hydrogen or an alkyl radical having 1 to

4 carbon atoms; R^7 is an alkyl radical having 1 to 4 carbon atoms; and X is Cl, Br, I, $1/2SO_4$, $MeOSO_3$, $(MeO)_2PO_2$, $1/2MeOPO_3$, $(EtO)_2PO_2$, $1/2EtOPO_3$ or $EtOSO_3$; and 90 to 10 percent by weight of at least one compound of the formula (B):



(i)

(ii)



(iii)

wherein R^4, R^5, and R^7 and X are as defined above, and R^8 is a saturated or unsaturated alkyl radical having 8 to 24 carbon atoms, $R^9 = R^7$ or a polyalkylene oxide group, and A is O, S, or NH, or combinations thereof, and n represents an integer from 1 to 6, said components (A) and (B) add up to 100% by weight of the mixture of conditioner components; and

(b) 82 to 50% by weight water and, optionally at least one auxiliary which is employable in fabric conditioners, which bring the conditioner formulation up to 100% by weight.

4,963,275

DISPERSANT ADDITIVES DERIVED FROM LACTONE MODIFIED AMIDO-AMINE ADDUCTS

Antonio Gutierrez, Mercerville, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation-in-part of Ser. No. 916,218, Oct. 7, 1986, and Ser. No. 126,405, Nov. 30, 1987, Pat. No. 4,857,217. This application Apr. 6, 1988, Ser. No. 178,099

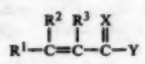
Int. Cl.[5] C10M *105/22, 105/56*

U.S. Cl. 252—47 **45 Claims**

1. A poly (C_5 to C_9) adduct of an aminated hydrocarbyl substituted dicarboxylic acid producing material useful as an oil additive, which comprises the product formed by reacting

(A) a long chain hydrocarbyl substituted C_4 to C_{10} monounsaturated dicarboxylic acid producing material formed by reacting an olefin polymer of C_2 to C_{10} monoolefin having a number average molecular weight of about 300 to 10,000 and a C_4 to C_{10} monounsaturated acid material, said acid producing material having an average of at least about 0.8 dicarboxylic acid producing moieties, per molecule of said olefin polymer present in the reaction mixture used to form said acid producing material;

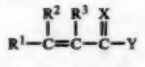
(B) an am ido-amine or a thioamido-amine characterized by being a reaction product of at least a polyamine and an alpha, beta-unsaturated compound of the formula:



wherein X is sulfur or oxygen, Y is $—OR^4$, $—SR^4$, or $—NR^4(R^5)$, and R^1, R^2, R^3, R^4 and R^5 are the same or different and are hydrogen or substituted or unsubstituted hydrocarbyl; and

(C) a C_5 to C_9 lactone material, said poly (C_5 to C_9) adduct containing the unit $—[C(O)(CH_2)_zO]—_m$ wherein m has an average value of from 0.2 to 100 and Z is 4 to 8.

30. A lubricating oil composition containing a lubricating oil and from about 0.1 to 20 wt. % of a poly (C_5–C_9) adduct prepared by contacting a hydrocarbyl substituted C_4 to C_{10} monounsaturated dicarboxylic acid producing material with an amido-amine compound under conditions sufficient to effect reaction of at least a portion of the primary amino groups on said amido-amine compound with at least a portion of the acid-producing groups in said acid producing material to form a first adduct, and then contacting said first adduct with a C_5 to C_9 lactone material under conditions sufficient to open the lactone ring of said lactone material to form said poly (C_5–C_9) adduct containing the unit $—[C(O)(CH_2)_zO]—_m$ wherein m has an average value of from 0.2 to 100 and z is 4 to 8, wherein said acid producing material is formed by reacting an olefin polymer of a C_2 to C_{10} monoloefin having a number average molecular weight of about 700 to 10,000 and a C_4 to C_{10} monounsaturated acid producing material, wherein there are an average of at least about 0.8 dicarboxylic acid producing moieties per molecule of said olefin polymer present in the reaction mixture used to form said acid producing material, and wherein said amido-amine compound has at least one primary amino group and is formed by reacting at least one polyamine with at least one alpha,beta-unsaturated compound of the formula:



wherein X is sulfur or oxygen, Y is $—OR^4$, $—SR^4$, or $—NR^4(R^5)$, and R^1, R^2, R^3, R^4 and R^5 are the same or different and are hydrogen or substituted or unsubstituted hydrocarbyl.

4,963,276

LUBRICANT COMPOSITION

Samuel Evans, Marly, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

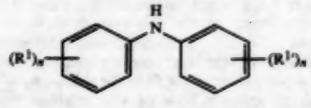
Filed Dec. 15, 1988, Ser. No. 284,568

Claims priority, application Switzerland, Dec. 24, 1987, 5055/87

Int. Cl.[5] C10M *135/26, 135/28*

U.S. Cl. 252—47.5 **18 Claims**

1. A composition containing at least one lubricant or one hydraulic fluid and a mixture of one or more compounds from series (A) and one or more compounds from series (B), the compounds of series (A) having the general formula

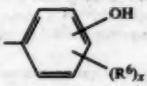


(I)

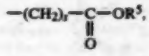
in which R^1 and $R^{1'}$ are identical or different and are —H, alkyl having 1 to 24 C atoms, cycloalkyl having 5 to 12 C atoms or phenyl-(C_1–C_4)alkyl and n is a number 0, 1 or 2, and the compounds of series (B) having the general formula

(II)

in which R^2 is —H alkyl having 1 to 24 C atoms, phenyl, phenyl which is substituted by NO_2, Cl, Br, F, C_1–C_{12}alkyl or C_1–C_{12}alkoxy, phenyl-(C_1–C_4)alkyl, phenyl of the general formula



in which R^6 is —H, alkyl having 1 to 20 C atoms or phenyl-(C_1–C_4)alkyl and x is 1 or 2, or R^2 is cyclohexyl or cyclohexenyl which is unsubstituted or substituted by methyl, and R^3 is —H, alkyl having 1 to 24 C atoms, and the radicals R^4 are identical or different and are alkyl having 4 to 18 C atoms, phenyl, tolyl, benzyl or



in which s is 1 or 2 and R^5 is alkyl having 1 to 24 C atoms.

4,963,277

INCREASING VISCOSITY STORAGE STABIITY OF MANNICH BASE DISPERSANT/VI-IMPROVERS

David J. Fenoglio, Wheaton; Yoon S. Song, and Robert J. Basslay, both of Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Oct. 20, 1988, Ser. No. 260,254
Int. Cl.[5] C10M *105/58*
U.S. Cl. 252—51.5 A **11 Claims**

1. A method for improving the viscosity stability upon storage of a Mannich base viscosity index improving composition, said composition comprising about 85 to 95 wt. % of low viscosity hydrocarbon oil and about 5 to 15 wt. % of a Mannich base condensation product of an oxidized polyolefin, an aliphatic aldehyde, and an aliphatic amine, said method comprising the steps of:

(a) combining said Mannich base viscosity index improving composition with an oxidizing material selected from the group consisting of a dialkyl peroxide, an alkyl hydroperoxide, an arylalkyl hydroperoxide, and a mixture thereof, wherein the alkyl moieties of said hydroperoxides contain seven carbons or less, and

(b) maintaining the resulting combination at a temperature of about 250° F. to about 400° F. for a time period of about 1 to about 5 hours.

11. A method for operating an internal combustion engine comprising the steps of:

(a) charging the crankcase of said engine with a lubricating oil composition containing a major amount of oil of lubricating viscosity and a minor viscosity-index improving amount of a Mannich base viscosity index improving composition, said viscosity index improving composition comprising about 85 to 95 wt. % of low viscosity hydrocarbon oil and about 5–15 wt.% of a Mannich base condensation product of an oxidized polyolefin, an aliphatic aldehyde, and an aliphatic amine, wherein said Mannich base viscosity index improving composition is obtained by the process comprising the steps of:

(i) combining said Mannich base viscosity index improving composition with an oxidizing material selected from the group consisting of a dialkyl peroxide, an alkyl hydroperoxide, an arylalkyl hydroperoxide, and a mixture thereof, wherein the alkyl moieties of said hydroperoxides contain seven carbons or less, and

(ii) maintaining the resulting combination at a temperature of about 250° F. to about 400° F. for a time period of about 1 to about 5 hours; and

(b) operating said engine with said crankcase so charged.

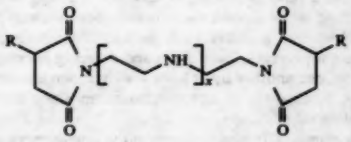
4,963,278

LUBRICANT AND FUEL COMPOSITIONS CONTAINING REACTION PRODUCTS OF POLYALKENYL SUCCINIMIDES, ALDEHYDES, AND TRIAZOLES

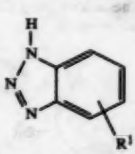
David A. Blain, Morrisville, Pa.; Angeline B. Cardis, Florence, N.J., and Sylvia S. McGonigle, Chadds Ford, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 290,405, Dec. 29, 1988, Pat. No. 4,897,086. This application Nov. 30, 1989, Ser. No. 443,687
Int. Cl.[5] C10M *133/16, 133/44*
U.S. Cl. 252—51.5 A **13 Claims**

1. An improved lubricant composition comprising a major proportion of an oil of lubricating viscosity or a grease prepared thereof and between about 0.1% and 10% by weight of the total composition of a multifunctional detergent/dispersant/antioxidant reaction product obtained by reacting a polyalkenyl-substituted succinimide having the structural formula:



where R is an alkyl or alkenyl or alkenyl group of 9 to 150 carbon atoms with a triazole having the structural formula:



where R^1 is hydrogen or an alkyl, aryl, arylalkyl, or alkylaryl group of 1 to 12 carbon atoms with an aldehyde wherein the polyalkenyl-substituted succinimide, aldehyde and triazole are reacted in a mole ratio of succinimide to aldehyde to triazole respectively of between about 1 to 0.1 to 0.1 and about 1 to 4 to 4 at temperatures varying from about 100° C. to about 200° C. at ambient pressures.

4,963,279

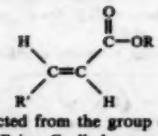
C14-CARBOXYLATE POLYMER AND VISCOSITY INDEX IMPROVER CONTAINING OLEAGINOUS COMPOSITIONS

Celio Rosental, Rio De Janeiro, Brazil, and Albert Rossi, Warren, N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Feb. 28, 1989, Ser. No. 346,621
Int. Cl.[5] C10M *107/30*
U.S. Cl. 252—56 R **89 Claims**

1. A lubricating oil composition comprising lubricating oil and

(i) an amount effective to improve the low temperature flow properties of said lubricating oil composition of first additive consisting essentially of at least one low molecular weight polymer or interpolymer of at least one unsaturated carboxy ester monomer represented by the formula



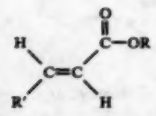
(I)

herein R' is selected from the group consisting of hydrogen and COOR, and R is a C-alkyl group; and

(ii) an amount effective to improve the viscosity index of said lubricating oil composition of second additive comprising copolymer of ethylene and at least one C_3 to C_{18} alpha-olefin monomer, said copolymer comprising intramolecularly heterogeneous copolymer chains containing at least one crystallizable segment of methylene units and at least one low crystallinity ethylene-C_3 to C_{18}-alpha-olefin copolymer segment, wherein said at least one crystallizable segment comprises at least about 10 weight percent of said copolymer chain and contains an average ethylene content of t least about 57 weight percent, wherein said low crystallinity segment contains an average ethylene content of not greater than about 53 weight percent, and wherein said copolymer has a molecular weight distribution characterized by at least one of a ratio of M_w/M_n of less than 2 and a ratio of M_z/M_w of less than 1.8, and wherein an individual intramolecularly heterogeneous chain contains at least two portions, each portion comprising at least 5 weight percent of said chain and differing in composition from one another by at least 7 weight percent ethylene.

46. A lubricating oil concentrate composition comprising lubricating oil and:

(i) an amount effective to improve the low temperature flow properties of lubricating oil compositions derived from said concentrate of first additive consisting essentially of at least one low molecular weight polymer or interpolymer of at least one unsaturated carboxy ester monomer represented by the formula



(I)

wherein R' is selected from the group consisting of hydrogen and COOR, and R is a C_{14} alkyl group; and

(ii) an amount effective to improve the viscosity index of lubricating oil compositions derived from said concentrate of second additive comprising copolymer of ethylene and at least one C_3 to C_{18} alpha-olefin monomer, said copolymer comprising intramolecularly heterogeneous copolymer chains containing at least one crystallizable segment of methylene units and at least one low crystallinity ethylene C_{13} to C_{18}-alpha-olefin copolymer segment, wherein said at least one crystallizable segment comprises at least about 10 weight percent of said copolymer chain and contains an average ethylene content of at least about 57 weight percent, wherein said low crystallinity segment contains an average ethylene content not greater than about 53 weight percent, and wherein said copolymer has a molecular weight distribution characterized by at least one of a ratio of M_w/M_n of less than 2 and a ratio of M_z/M_w of less than 1.8, and wherein an individual intramolecularly heterogeneous chain contains at least two portions, each portion comprising at least 5 weight percent of said chain and differing in composition from one another by at least 7 weight percent ethylene.

4,963,280

METHOD AND COMPOSITION FOR IMPROVING THE ENERGY EFFICIENCY OF HEAT PUMP SYSTEMS

Charles H. T. Wilkins, Tuscaloosa, Ala.; Jack Hammack, Hattiesburg, Miss., and Charles B. Thompson, Tuscaloosa, Ala., assignors to Charles Henry Tully-Wilkins, Jr., Tuscaloosa, Ala. and Linda Ann Tully-Wilkins Frazier, Irvin, Tex., by Thelma Crawford Wilkins, executrix

Filed Jan. 29, 1988, Ser. No. 149,737
Int. Cl.[5] C10M *115/06*
U.S. Cl. 252—58 10 Claims

1. A method of improving the efficiency of a heat pump system comprising introducing into the system a polar compound comprising a chlorinated α-olefin or a chlorinated paraffin, wherein said polar compound is liquid under said systems operating conditions.

3. An additive for heat pump systems comprising a polar compound and a carrier fluid, wherein said polar compound is a chlorinated α-olefin or a chlorinated paraffin.

4,963,281

LOW LOSS OXIDE MAGNETIC MATERIAL

Hikohiro Togane, Sagamihara, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 330,284, Mar. 29, 1989, Pat. No. 4,877,543. This application Jun. 15, 1989, Ser. No. 366,443
Claims priority, application Japan, Jun. 19, 1987, 62-152858
The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.
Int. Cl.[5] C04B *35/26*
U.S. Cl. 252—62.6 2 Claims

1. A ferrite magnetic material exhibiting low power loss for use as a deflector yoke core for a high speed scanning cathode ray tube, consisting essentially of 43–47 mol % of Fe_2O_3, 27–35 mol % of MgO, 13–20 mol % of ZnO, 3–10 mil % of MnO, from about 0.1 to 1.5 wt. % of Bi_2O_3 and CuO in an amount of from about 0.2 to 1.5 wt. %.

4,963,282

LIQUID COMPOSITIONS CONTAINING THIOCARBAMATES

Scott T. Jolley, and Betsy J. Butke, both of Mentor, Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed May 11, 1989, Ser. No. 350,600
Int. Cl.[5] C09K *5/04;* C10M *105/52*
U.S. Cl. 252—67 24 Claims

1. A liquid composition comprising:

(A) a major amount of at least one fluorine-containing hydrocarbon containing one or two carbon atoms; and

(B) a minor amount of at least one soluble organic lubricant comprising at least one organic thiocarbamate characterized by the formulae

$$R_1R_2NC(X)SC(R_3R_4)[C(H)(R_5)]_aZ, \text{or} \quad (I)$$

$$[R_1R_2NC(X)SC(R_3R_4)[C(H)(R_5)]_aC(X)A]_2Z \quad (II)$$

wherein

R_1 and R_2 are each independently lower alkyl, aryl, aralkyl or together form a heterocyclic group in which the ring is completed through the nitrogen;

X is O or S;

A is O, S or NR;

R is H or a lower alkyl group;

R_3, R_4 and R_5 are each independently H, lower alkyl or aryl groups;

a is 0 or 1;

Z is —CN, —S(O)R_6, —S(O)OR_6, —S(O)$_2$R$_6$, —S(O)$_2$OR_6, or —C(O)Y;

R_6 is H, alkyl or aralkyl;

Y is H, —OH, —R_7, —OR_7, —OR_8OH, or —NR_9R_{10};

R_7 is an alkyl, aryl or aralkyl group;

R_8 is an alkYlene group of 1 to about 7 carbon atoms;

R_9 and R_{10} are each independently H, alkyl, hydroxyalkyl, cycloaliphatic, or together form cyclic group in which the ring is completed through the nitrogen atom; and
Z' is $—R_8—$ or $—R_8—A—R_8—$.

4,963,283
SOLUTIONS OF PERHALOGENATED COMPOUNDS
David J. Lapham, Derbyshire, and Nicholas A. Troughton, Widnes, both of United Kingdom, assignors to Micro-Image Technology Limited, London, United Kingdom
Filed Jun. 5, 1989, Ser. No. 361,144
Claims priority, application United Kingdom, Jun. 11, 1988, 8813891
Int. Cl.[5] C23F 1/02
U.S. Cl. 252—79.3 12 Claims

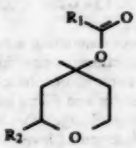
1. A solution of a perfluorinated sulphonic acid surfactant in a solvent system, said solution being miscible with strong mineral or organic acid to reduce the surface tension thereof, in which solution the solvent system consists essentially of one or more acidic phosphorous containing compounds selected from water soluble di- or poly-phosphonic acids, water soluble di- or poly-phosphinic acids and water soluble salts of any of the aforesaid acids together with the sufficient water to form the solution.

4,963,284
TRANSLUCENT COMBINATION SOAP-SYNTHETIC DETERGENT BAR
Mario Novakovic, Kew Garden Hills, N.Y., and Michael A. Esposito, Randolph, N.J., assignors to Finetex, Inc., Elmwood Park, N.J.
Continuation-in-part of Ser. No. 19,358, Feb. 26, 1987, Pat. No. 4,851,147. This application Feb. 10, 1989, Ser. No. 310,057
The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.
Int. Cl.[5] C11D 9/26
U.S. Cl. 252—108 25 Claims

1. A translucent combo bar comprising a fatty acid soap, a water soluble synthetic organic detergent and a translucency enhancing amount of a lower alkanol mono-amine.

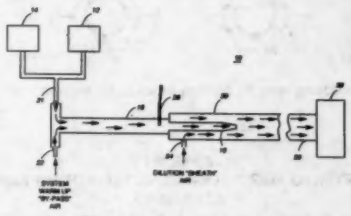
4,963,285
2,4,4-IRISUBSTITUTED TETRAHYDRO PYRANYL ESTERS AND ORGANOLEPTIC USES THEREOF
Mark A. Sprecker, Sea Bright, and Roger E. Greene, Oakhurst, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.
Filed Feb. 9, 1989, Ser. No. 308,182
Int. Cl.[5] C07D 69/068; C11D 3/50, 3/395
U.S. Cl. 252—174.11 32 Claims

1. A 2,4,4-trisubstituted tetrahydro pyranyl ester defined according to the structure:



wherein R_1 represents methyl or ethyl and R_2 represents C_2–C_4 straight chain or branched chain alkyl or alkenyl.

4,963,286
DISPERSIONS OF SILICA IN CARBON AND A METHOD OF MAKING SUCH DISPERSIONS
Roy T. Coyle, and Phillman N. Ho, both of Yorba Linda, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.
Continuation of Ser. No. 50,157, May 15, 1987, Pat. No. 4,839,150. This application Dec. 19, 1988, Ser. No. 286,271
Int. Cl.[5] C09K 3/00
U.S. Cl. 252—183.14 14 Claims



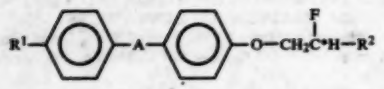
1. A dispersion of silica particles in carbon having a surface area greater than 50 m^2/gram produced by the process comprising:
(a) mixing a source of carbon selected from the group consisting of residual oils and crude petroleum with a source of silica; and
(b) heating said mixture of said silica source and said carbon source in a substantially nonoxidizing atmosphere at temperatures sufficient to carbonize the carbon source and thereby form said dispersion of silica particles in carbon.

4,963,287
AQUEOUS ALKALI METAL HALOGENITE COMPOSITIONS
Richard S. Hutchings; Saundra L. Nolte, and Jeffrey S. Weaver, all of Cincinnati, Ohio, assignors to The Drackett Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 54,338, May 26, 1987, abandoned. This application Nov. 1, 1988, Ser. No. 267,650
Int. Cl.[5] C01B 11/00, 11/10
U.S. Cl. 252—187.23 22 Claims

1. A stable aqueous, alkaline cleaning composition comprising on a weight basis about 5% or less of an alkali metal halogenite; from about 0.01 to about 3% of a perfume normally chemically incompatible with said halogenite in aqueous media, and a stabilizer that is an anionic surfactant, said stabilizer being present in the composition at least in an amount effective to stabilize the composition as evidenced by a substantial absence of chlorine dioxide in the composition, wherein the composition contains no surfactant components which interfere with or assist in the functioning of the anionic surfactant as a stabilizer.

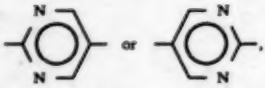
4,963,288
FLUOROALKOXYDIPHENYL PYRIMIDINE, LIQUID CRYSTAL COMPOSITION AND ELECTRO-OPTIC ELEMENT
Shinichi Saito, Ichihara; Kazutoshi Miyazawa, Yokohama; Kouji Ohno, Ichihara, and Hiromichi Inoue, Yokohama, all of Japan, assignors to Chisso Corporation, Osaka, Japan
Filed Mar. 20, 1989, Ser. No. 326,033
Claims priority, application Japan, Mar. 28, 1988, 63-71891
Int. Cl.[5] C09K 19/34; C07D 239/02
U.S. Cl. 252—299.61 5 Claims

1. A fluoroalkoxydiphenyl pyrimidine represented by the following formula:



(I)

wherein R^1 is alkyl or alkoxy of 4–9 carbon atoms, R^2 is alkyl of 5–8 carbon atoms, —A— is



and * indicates that its carbon atom is an asymmetric carbon atom.

4,963,289

METHOD FOR PRODUCING MONODISPERSE AEROSOLS

Lawrence W. Ortiz, Los Alamos, N. Mex., and Sidney C. Soderholm, Pittsford, N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 246,062, Sep. 19, 1988, Pat. No. 4,917,830. This application Jun. 8, 1989, Ser. No. 331,985

Int. Cl.[5] C09K *3/30*

U.S. Cl. 252—305 **9 Claims**

1. A method of producing a monodisperse aerosol comprising the steps of:

mixing an organic liquid having a low vapor pressure with an aqueous solution having a high population of seed nuclei;

nebulizing said mixed organic liquid and said aqueous solution;

heating to flash vaporize nebulized organic liquid and said aqueous solution to produce vapors of said organic liquid and particles of said aqueous solution;

cooling said vapors and said particles with a surrounding flow of cool air to condense said vapors onto said particles, and to promote uniform growth of said condensed vapors on said particles; and

outputting a monodisperse aerosol comprising said condensed vapors on said particles.

4,963,290

CORROSION INHIBITORS OF STEELS AND AQUEOUS COMPOSITIONS OF ALKALI MEAL HALIDE CONTAINING THEM

Joëlle Bressan, Rosny Sous Bois, and Jacques Mezon, Saint Gratien, both of France, assignors to Gaz de France (Service National), Paris, France

Filed Feb. 13, 1989, Ser. No. 310,733

Claims priority, application France, Feb. 18, 1988, 88 01935

Int. Cl.[5] C23F *11/06*

U.S. Cl. 252—387 **18 Claims**

1. A corrosion-inhibiting agent comprising a ternary mixture of inorganic compounds containing at least one strong base, at least one molybdate and at least one inorganic phosphate, said ternary mixture being adapted for inhibiting the corrosion of steels in contact with aqueous compositions of alkali metal halide at concentrations of said halide above 60% by weight and at temperatures above 160°.

14. A method for inhibiting the corrosive effects of an aqueous composition of alkali metal halide upon steels when such composition is used as a working fluid in high temperature absorption heat pump systems, said method comprising adding to said composition a ternary mixture of inorganic compounds comprising at least one strong base, at least one molybdate, and at least one inorganic phosphate.

4,963,291

INSULATING ELECTROMAGNETIC SHIELDING RESIN COMPOSITION

Robert M. Bercaw, Box 100, Rte. 3, Winona, Minn. 55987

Continuation-in-part of Ser. No. 206,252, Jun. 13, 1988, abandoned. This application May 10, 1989, Ser. No. 352,704

Int. Cl.[5] H01B *1/06*

U.S. Cl. 252—512 **10 Claims**

1. A filler blend for making electromagnetic shielding resins which comprises,

(a) 8–55 percent by volume of electroconductive particles of spherical crossectional dimensions ranging from 0.5–50 microns having a resistivity less than 1×10^2 ohms, and

(b) electrically non-conductive particles of spherical crossectional dimensions ranging from 0.005–2 microns having a resistivity greater than 1×10^8 ohms.

8. A molding composition comprising a uniform mixture of a filler blend of claim 1 with an electrically non-conductive binder resin selected from the group consisting of thermoplastic and thermosetting polymers having a volume resistivity of at least 1×10^{10} ohms-centimeters wherein the volume of said filler in said resin is 30–80 percent by weight.

4,963,292

HIGHER CARBOXYLIC ACID TRIESTER OF ADAMANTANE TRIOL AND LUBRICATING OIL CONTAINING THE SAME

Kosaku Honna, Sodegaura, and Hiromichi Seiki, Ichihara, both of Japan, assignors to Idemitsu Kosan Company, Limited, Tokyo, Japan

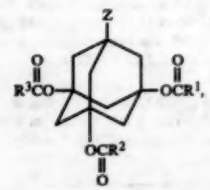
Filed Sep. 27, 1989, Ser. No. 413,537

Claims priority, application Japan, Oct. 12, 1988, 63-254997; Jan. 26, 1989, 64-17253

Int. Cl.[5] C10M *1/24*; C09F *5/08*

U.S. Cl. 252—56 S **3 Claims**

1. A higher carboxylic acid triester of adamantane triol represented by the general formula



in which Z is a hydrogen atom or a hydroxyl group and R^1, R^2 and R^3 are each, independently from the others, an alkyl or cycloalkyl group having 4 to 30 carbon atoms.

4,963,293

FLOW CONTROL METHOD FOR DECONTAMINATING RADIOACTIVELY CONTAMINATED NUCLEAR STEAM GENERATOR

Robert D. Burack, Pleasant Hills; August J. Friedrich, Bethel Park, and Albert J. Dietrich, North Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 7, 1983, Ser. No. 501,979

Int. Cl.[5] G21F *9/00*

U.S. Cl. 252—626 **15 Claims**

1. A method for decontaminating a radioactively contaminated nuclear steam generator comprising:

introducing a decontamination solution into a channel head of said steam generator and filling said channel head and a portion of the heat exchange tubes adjacent to said channel head to a predetermined level with said decontamination solution for removing radioactive contaminants from the surfaces of said channel head and said tubes;

circulating said decontamination solution through said chan-

nel head while maintaining said decontamination solution in said tubes;

lowering the level of said decontamination solution until said decontamination solution is drained from said tubes while circulating said decontamination solution through said channel head;

raising the level of said decontamination solution until said decontamination solution reaches said predetermined level while circulating said decontamination solution through said channel head; and

removing said decontamination solution from said steam generator.

4,963,294

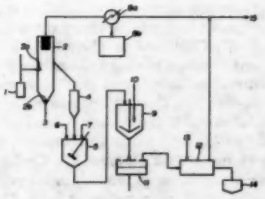
METHOD OF PREPARING URANIUM DIOXIDE POWDER FROM URANIUM HEXAFLUORIDE

Tadao Yato, Mito; Hiroshi Tanaka, Omiya; Toshiaki Kikuchi, Okuyama, and Toshio Onoshita, Ibaraki, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1987, Ser. No. 139,443

Int. Cl.[5] C09K *11/04*; G21G *4/00*; C01G *43/06*, *43/025*

U.S. Cl. 252—636 **7 Claims**



1. A method of fabricating uranium dioxide (UO_2) powder from uranium hexafluoride (UF_6), comprising

(1) reacting UF_6 gas with steam with controlling the temperature of reaction between said UF_6 gas and said steam within the range of 200° to 700° C., to form a solid uranyl fluoride (UO_2F_2) or uranium oxide with a O/U ratio (oxygen-to-uranium atomic ratio) of 2.7 to 3, mixtures of said uranyl fluoride and said uranium oxide,

(2) dissolving said solid in water or nitric acid to form an aqueous uranyl solution containing said uranyl fluoride, or uranyl nitrate ($UO_2(NO_3)_2$), or mixtures of said uranyl fluoride and uranyl nitrate,

(3) reacting said aqueous uranyl solution with ammonia to precipitate ammonium diuranate (ADU),

(4) filtering said precipitate,

(5) drying said precipitate,

(6) calcining said dry precipitate, and

(7) reducing said calcined precipitate to form UO_2 powder.

4,963,295

PROCESS FOR THE PREPARATION OF CLAY LOADED METAL COMPLEXES CATALYST AND A PROCESS FOR THE HYDROGENATION OF OILS USING THE CATALYST SO PREPARED

Mirza M. T. Khan, and M. R. H. Siddiqui, both of Bhavnagar, India, assignors to Council of Scientific and Industrial Research, New Delhi, India

Division of Ser. No. 114,118, Oct. 27, 1987, abandoned. This application Mar. 2, 1989, Ser. No. 317,918

Int. Cl.[5] C11C *3/12*

U.S. Cl. 260—409 **6 Claims**

1. A process for the hydrogenation of oil which comprises reacting a mixture of said oil and a solvent with hydrogen gas at a temperature of about 20°–45° C. (ambient temperature) in the presence of a clay loaded metal catalyst prepared by refluxing a platinum group metal complex of the formula MX_{n3} wherein M is a platinum group metal, X is halide and n is 1,2,3 or 4 with a stigma donor-substituted phosphine or arsine ligand and clay in the presence of an organic solvent, precipitating the solution, drying under vacuum and, if required, reprecipitating for purification.

6. A process for hydrogenation of oil as claimed in claim 1 wherein said oil is Jojoba Oil or Castor Oil.

4,963,296

PROCESS FOR THE PREPARATION OF PROPELLANT CHARGE POWDER

Günther Niedermeier, Ampfing; Helmut Pausch, Waldkraiburg; Wolfgang Miehling, Mühldorf am Inn; Jürgen Knobloch, and Wolfgang Helmich, both of Waldkraiburg, all of Fed. Rep. of Germany, assignors to WNC-Nitrochemie GmbH, Fed. Rep. of Germany

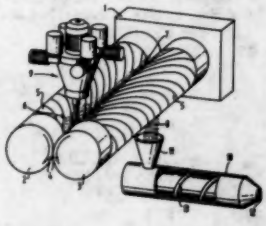
PCT No. PCT/EP87/00585, § 371 Date Jun. 16, 1988, § 102(e) Date Jun. 16, 1988, PCT Pub. No. WO88/02743, PCT Pub. Date Apr. 21, 1988

PCT Filed Oct. 8, 1987, Ser. No. 228,921

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1986, 3635296

Int. Cl.[5] C06B *21/00*; D03D *23/00*, *43/00*; F42B *3/00*

U.S. Cl. 264—3.2 **11 Claims**



1. A continuous process for manufacturing a propellant charge powder from a raw powder mixture made moist by water comprising the steps of:

continuously supplying a flow of a water-moistened raw powder mixture to adjacent intake ends of a pair of cooperating shearing rollers defining a nip of adjustable width, each roller having its own drive with infinitely adjustable speed of rotation;

homogenizing and gelatinizing the water-moistened raw powder mixture, while controllably expressing water therefrom, by kneading the same at a predetermined elevated temperature using said shearing rollers, to produce a homogenous gelatinized material;

continuously removing said gelatinized material from discharge ends of said shearing rollers opposite said intake ends thereof while selecting the width of the nip and the speed of rotation of said shearing rollers so that said material, removed from said rollers after said gelatinizing step, has a residual moisture content of less than three-percent by weight;

continuously granulating said gelatinized material removed from said shearing rollers, to produce a granulate;

extruding said granulate by an extruder operating without a kneading action to mold said granulate into powder strands;

continuously cutting said powder strands into predetermined lengths to form the powder proper.

4,963,297

SPONTANEOUS VESTICULATION OF MULTILAMELLAR LIPOSOMES

Thomas D. Madden, Vancouver, Canada, assignor to The Liposome Company, Inc., Princeton, N.J.

Filed Dec. 22, 1987, Ser. No. 136,267

Int. Cl.[5] A61K *9/133*; B01J *13/02*

U.S. Cl. 264—4.3 **10 Claims**

1. A method for spontaneously forming unilamellar vesicles from multilamellar vesicles comprising incubating a multilamellar lipid consisting essentially of dimyristoylphosphatidylglycerol or its admixtures with dimyristoylphosphatidylcholine in a low ionic strength medium of 50 mM salt or less at neutral pH, at about the gel-to-liquid crystalline transition temperature of the lipid until unilamellar vesicles having a particle size of about 400 nanometers or less are obtained.

4,963,298

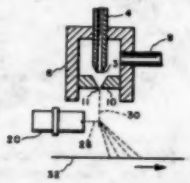
PROCESS FOR PREPARING FIBER, ROVINGS AND MATS FROM LYOTROPIC LIQUID CRYSTALLINE POLYMERS

Steven R. Allen; Aziz A. Mian, both of Wilmington, and Sam L. Samuels, Claymont, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 1, 1989, Ser. No. 304,461

Int. Cl.[5] D01D *5/11*

U.S. Cl. 264—12 **11 Claims**



1. A process for preparing subdenier from lyotropic liquid crystalline polymers comprising (1) extruding a stream of an optically anisotropic solution of a polymer through a spinneret orifice into a chamber, (2) introducing a pressurized gas into said chamber, (3) directing the gas in the flow direction of and in surrounding contact with said stream within the chamber, (4) passing both the gas and stream through an aperture into a zone of lower pressure at a velocity sufficient to attenuate the stream and fragment it into fibers, and (5) contacting the fragmented stream in said zone with a coagulating fluid.

4,963,299

SURFACE TREATMENT OF POLYOLEFIN OBJECTS

Boudewijn J. R. Scholtens, Sittard, and Hendrikus J. J. Rutten, Maastricht, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Jun. 24, 1988, Ser. No. 210,905

Claims priority, application Netherlands, Jun. 26, 1987, 8701502; Sep. 24, 1987, 8702271

Int. Cl.[5] B29C *71/00, 71/04*

U.S. Cl. 264—22 **14 Claims**

1. Process for the treatment of surfaces of highly oriented polyolfein objects, comprising the steps of converting a solution or melt of a linear polyolefin witha weight average molecular weight of at least 400,000 g/mol, at a temperature above the dissolution temperature of said solution, or above the melting temperature of said melt, into a shaped object, converting this object into a gel-object by cooling, and stretching the gel-object at elevated temperature after removal of the solvent, wherein the surface of the object is contacted with a solution of a radical-forming compound and that the object is then exposed to a temperature of at least 30° C. for at least 1 minute.

4,963,300

PROCESS FOR THE PREPARATION OF LAMINATES

Kurt Meier, Binningen; Theobald Haug, Frenkendorf, both of Switzerland, and Wolfgang Scharf, Grenzach-Wyhlen, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 5, 1988, Ser. No. 279,747

Claims priority, application Switzerland, Dec. 15, 1987, 4881/87

Int. Cl.[5] B29C *43/02, 43/20, 43/30*

U.S. Cl. 264—22 **11 Claims**

1. A process for the preparation of a laminate comprising

(i) preparing a layer by contacting a fibrous substrate with a curable mixture essentialy of at least one epoxy resin having an average at least two 1,2-epoxide molecule and, as initiator, at least one compound of formula I

$$[R^1(Fe^{II}R^2)_a]^{ab\oplus} \quad ab.[X]^{\ominus} \qquad (I)$$

in which a and b are independently of one another 1 or 2, R^1 is a carboxylic aromatic hydrocarbon having 6–24 carbons atoms which is unsubstituted or substituted one or more times with halogen, C_1–C_8alkyl, C_1–C_8alkoxy or phenyl; or R^1 is a heterocyclic aromatic hydrocarbon having 4–11 carbon atoms and 1 to 2 O or S atoms unsubstituted or substituted one or more times with halogen, C_1–C8alkyl, C_1–C8alkoxy or phenyl; R^2 is a carbocylic aromatic hydrocarbon having 6–24 carbons atoms which is unsubstituted or substituted one or more times with halogen, C_1–C_8alkyl, C_1–C_8alkoxy or phenyl; or R^2 is a heterocyclic aromatic hydrocarbon having 4–11 carbon atoms and 1 to 2 O or S atoms unsubstituted or substituted one or more times with halogen, C_1–C_8alkyl, C_1–C_8alkoxy or phenyl; or R^2 is an indenyl or a cyclopentadienyl anion unsubstituted or substituted with C_1–C_8alkyl or C_1–C_8alkoxy; X^- is an anion of a partly fluorinated or perfluorinated aliphatic or aromatic sulfonic acid or an anion $[LQ_m]$ wherein L is P, As or Sb, and Q is fluorine or a mixture of fluorine and hydroxyl, m corresponds to a value which exceeds the valence of L by one;

(ii) preparing a laminated sequence from at least two layered materials which are to be bonded together, at least one of which is a layer according to step (i) wherein practically no preliminary crosslinking occurs;

(iii) placing the laminated sequence in a compression mold;

(iv) compression molding of the laminated sequence wherein pressure and temperature are selected in such a ay that a liquid matrix is present at the beginning of this step in which an initial fall in viscosity is produced so that entrained gases can escape from the laminated sequence; and

(v) executing the crosslinking reaction such that the rise in

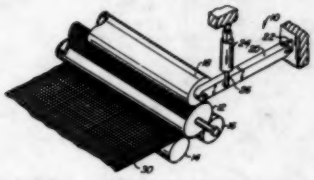
viscosity is carried out so quickly that the resin which flows out does not bind the compression mold.

4,963,301

METHOD FOR FABRICATION OF REFRACTORY COMPOSITE TUBING

H. O. Davis, Alameda, and James M. Barrier, Anaheim Hills, both of Calif., assignors to Kaiser Aerotech, San Leandro, Calif.

Filed Jun. 28, 1988, Ser. No. 212,627
Int. Cl.[5] C01B *31/00*; C04B *35/64*
U.S. Cl. 264—29.7 15 Claims



1. A method for forming reinforced refractory composite tubes, said method comprising:

(a) rolling a continuous reinforcement fabric onto a mandrel under tension while simultaneously applying heat and pressure, said fabric being pre-impregnated with a refractory matrix precursor or served with a thermoplastic so that successive plies of the fabric are compressed without the introduction of mechanical defects;

(b) curing the refractory matrix precursor or thermoplastic serving on the rolled reinforcement fabric under a vacuum at an elevated temperature;

(c) converting the cured refractory matrix precursor or thermoplastic on the rolled reinforcement fabric to the corresponding refractory matrix by pyrolysis while the rolled reinforcement fabric is present on a mandrel having a coefficient of thermal expansion from 1.1 to 10 times greater than that of the refractory matrix;

(d) impregnating the rolled reinforcement fabric with additional matrix precursor;

(e) converting the additional matrix precursor to matrix; and

(f) repeating steps (d) and (e) until a desired matrix density is achieved.

4,963,302

METHOD AND APPARATUS FOR QUALITY CONTROL OF MOLDED ARTICLES MANUFACTURED BY INJECTION MOLDING MACHINES OR DIE CASTING MACHINES

Friedrich Heindl, Baden; Franz Schnuecker, Kottingbrunn, and Anton Huber, Berndoft, all of Austria, assignors to Battenfeld Automatisierungstechnik GmbH, Kottingbrunn, Austria

Filed Jan. 23, 1989, Ser. No. 300,969
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1988, 3802147
Int. Cl.[5] B29C *45/76*
U.S. Cl. 264—40.4 6 Claims

1. A method for quality control of molded articles manufactured by means of injection molding machines or die casting machines, the method comprising the steps of:

manufacturing and ejecting the molded articles;

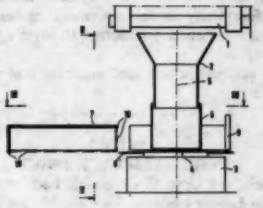
then initially accurately guiding each molded article automatically onto the center of a weighing zone of a test balance;

immediately subsequently carrying out a dynamic discharge weighing procedure of the molded article;

comparing the dynamic discharge weight of the molded articles to a desired weight and creating a difference signal;

controlling the injection molding machine or the die casting machine with the resulting difference signal to correct the weight of the molded articles;

protecting the entire weighing zone immediately after the dynamic discharge weighing of each individual molded article against ambient influences; and then



carrying out a precise static weighing procedure using said weighing zone of said test balance to determine whether the molded article is acceptable.

4,963,303

ULTRAFILTRATION POLYIMIDE MEMBRANE AND ITS USE FOR RECOVERY OF DEWAXING AID

Bryce P. Anderson, Carlsbad, Calif., assignor to Exxon Research & Engineering Company, Florham Park, N.J.

Division of Ser. No. 312,020, Feb. 16, 1985, Pat. No. 4,908,134.
This application Dec. 29, 1989, Ser. No. 458,880
Int. Cl.[5] B01D *13/00*
U.S. Cl. 264—41 7 Claims

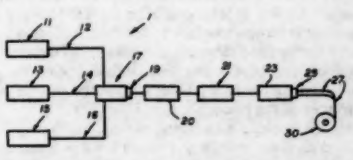
1. A method for producing a polyimide ultrafiltration membrane comprising the steps of dissolving a fully imidized polyimide polymer in a pro solvent and adding a pore forming agent characterized by having 43% more molar volume than the solvent used, a solubility parameter equal to or greater than that of the solvent and a polar end and substantial hydrocarbon character, to produce a casting solution, using said casting solution to produce a thin layer of said polyimide polymer/solvent/pore former, and quenching the layers in a quenching solvent.

4,963,304

PROCESS FOR PREPARING MICROPOROUS MEMBRANES

Jang-hi Im, and C. C. Chau, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 26, 1988, Ser. No. 249,034
The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.
Int. Cl.[5] B29C *67/20*
U.S. Cl. 264—49 28 Claims



1. A process for preparing a microporous membrane having a narrow pore size distribution and sharp size cutoff comprising:

forming a lamellar polymeric composition by dividing and reorienting a plurality of adjacent layers of polymeric materials, each layer comprising at least two different polymeric materials and having a thickness of from 0.03 to 5 microns to form discrete domains of said polymeric materials of random orientation, at least one of said differ-

ent polymeric materials having a preferential solubility in a selected solvent with respect to at least one other of said different polymeric materials;

forming a melt composition of said lamellar polymeric composition into a thin solid structure;

contacting said solid unitary structure with an extraction medium which has a preferential solubility for at least one of said at least two different polymeric materials, whereby said preferentially soluble polymeric material is removed from said solid unitary structure to form a porous unitary structure; and

separating said extraction medium from said porous unitary structure.

4,963,305

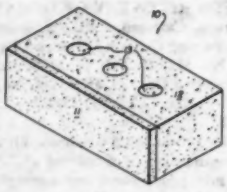
INSULATED FACE BRICK

John Cromrich, and Lynn B. Cromrich, both of Clancy, Mont., assignors to Leonard Bloom, Towson, Md., a part interest

Division of Ser. No. 733,576, May 13, 1985, Pat. No. 4,831,802, which is a continuation of Ser. No. 337,140, Jan. 5, 1982, abandoned. This application Apr. 10, 1989, Ser. No. 335,482

Int. Cl.[5] C04B *41/81*

U.S. Cl. 264—60 **1 Claim**



1. A method for forming insulated brick intended solely for use in building walls and having superior insulation qualities and lighter weight consonant with the load bearing capabilities of building bricks and the appearance of facing bricks, the method comprising the steps of:

dry mixing two parts of vermiculite and one part of brick clay, thereby forming a dry mixture having a vermiculite to clay ratio of approximately two-to-one by volume;

adding water to the dry mixture and mixing, so that a substantially dry admixture having expanded vermiculite and brick clay is formed;

forming a facing layer solely from brick clay;

molding and compressing the substantially dry admixture, so as to form a generally rectangular main body layer having parallel top and bottom faces, a pair of parallel side faces and a pair of parallel end faces, respectively, the top and bottom faces being substantially larger in area than the respective side faces, and the side faces being substantially larger in area than the respective end faces, the body layer further having at least one bore formed therein, the bore running from the top face to the bottom face perpendicularly thereto and substantially parallel to the side surfaces thereof, the bore being substantially centrally disposed and wherein the facing layer is disposed on one of the side surfaces of the body portion;

curing the molded admixture having the facing layer disposed thereon; whereby a cured brick is formed; and

firing the cured brick and the facing layer disposed thereon, whereby an integral brick is formed having top and bottom faces of the brick which are entirely devoid of facing layers, wherein the brick has the desired load bearing capability substantially between its top and bottom faces, whereby the outer facing layer only provides the desired appearance and weather resistance, and further whereby the weight of the brick is substantially reduced and the insulation value of the brick is substantially increased over conventional building bricks.

4,963,306

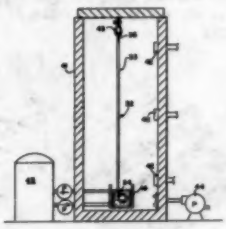
METHOD FOR MAKING FUSELESS SOFT TIP ANGIOGRAPHIC CATHETER

Thomas D. Weldon, Aquadilla, P.R., assignor to Novoste Corporation, Aquadilla, P.R.

Filed Jul. 14, 1988, Ser. No. 219,583

Int. Cl.[5] B29C *53/08, 71/02*

U.S. Cl. 264—101 **36 Claims**



1. The method for making elongated, fuseless, polymeric tubing having a first portion which exhibits kink and burst resistance and a second portion which is more pliable than the first portion, the method comprising:

extruding an elongated, fuseless, polymeric tube having a lumen therewithin;

heating a first portion of the elongated polymeric tube to an elevated temperature greater than 100° C. but less than the melting point of the polymeric tube for a sufficient time to effect solid state polymerization of the first portion;

maintaining a second portion of the elongated polymeric tube at a temperature lower than the first portion during the time said first portion is being heated, so as to inhibit solid state polymerization in the second portion and thus provide a second portion which is more pliable than the first portion.

4,963,307

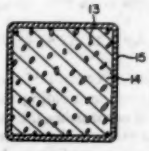
METHOD FOR PRODUCING A TABLET FOR RESIN-MOLDING SEMICONDUCTOR DEVICES AND RESIN-MOLDING METHOD MAKING USE OF THE TABLET

Kunito Sakai, Amagasaki; Sueyosi Tanaka, Fukuoka; Yasutugu Tutumi, Fukuoka, and Yutaka Morita, Fukuoka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Division of Ser. No. 107,336, Oct. 9, 1987, Pat. No. 4,826,931. This application Nov. 16, 1988, Ser. No. 271,905

Int. Cl.[5] B29C *43/56*

U.S. Cl. 264—102 **6 Claims**



1. A method of producing a resin tablet comprising:

placing a resin material having voids in a vacuum vessel and evacuating the vessel to remove air trapped in the voids of said resin material; and

heating the resin material to a temperature below the softening point of the resin material and applying pressure to said resin material to fuse at least a shell of said resin

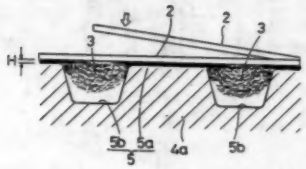
material and form a resin tablet substantially free of open pores.

4,963,308

METHOD OF MANUFACTURING A POWER TRANSMISSION BELT

Katuki Watanabe, and Mamoru Minamimure, both of Kobe, Japan, assignors to Bando Chemical Industries, Ltd., Kobe, Japan

Division of Ser. No. 173,639, Mar. 25, 1988, Pat. No. 4,895,555. This application Apr. 14, 1989, Ser. No. 337,887
Claims priority, application Japan, Mar. 31, 1987, 62-80351
Int. Cl.[5] B29C *45/14, 45/16*
U.S. Cl. 264—159 4 Claims



1. A method of manufacturing a power transmission belt, comprising the steps of:

providing a cylindrical internal die having an outer cylindrical surface with a plurality of grooves for forming power transmission belt teeth and a plurality of top faces separating said grooves for forming power transmission belt teeth bottoms and a cylindrical external die having an inner periphery spaced from said top faces of said cylindrical internal die a predetermined distance when said cylindrical internal die is in said cylindrical external die;

providing a bulky nonwoven fabric and placing said bulky nonwoven fabric around said outer cylindrical surface of said cylindrical internal die in a substnatially uncompressed state and so as to substnatially cover said outer cylindrical surface;

providing tensile cords and winding said tensile cords spirally over said nonwoven fabric on said outer cylindrical surface of said cylindrically internal die so as to compress said nonwoven fabric to a predetermined thickness on said top faces of said outer cylindrical surface;

putting said cylindrical external die around said cylindrical internal die;

injecting an elastomer material between aid cylindrical external die and said cylindrical internal die so as to form a cylindrically shaped belt body;

hardening said elastomer material; and

disjoining said dies and cutting said cylindrically shaped belt body at predetermined spacings therelong.

4,963,309

PROCESS AND APPARATUS FOR PROCESSING ELASTOMERIC MATERIALS IN PARTICULAR PLASTIC, RUBBER AND A MIXTURE THEREOF

Hans-Joachim Gohlisch, Hannover, and Heinz Klein, Pattensen, both of Fed. Rep. of Germany, assignors to Paul Troester Maschinenfabrik, Hannover, Fed. Rep. of Germany

Filed Feb. 24, 1989, Ser. No. 315,341
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1988, 3806387
Int. Cl.[5] B29C *47/32*
U.S. Cl. 264—175 11 Claims

1. Process of processing elastomeric material, in particular plastic, rubber or a mixture thereof to form a sheet of uniform thickness which comprises,

plasticizing and homogenizing said material in an extruder,

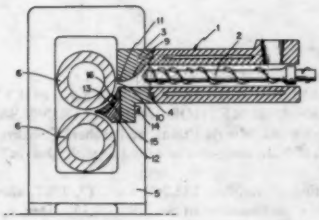
extruding said material through an extrusion head having an elongate extrusion aperture defined by straight, parallel outlet surfaces extending the full width of said aperture to form said material into a sheet of uniform thickness throughout its width;

directing said extruded sheet of material onto a circumferential surface of one roller of a calendar comprising two rollers rotating in opposite directions with a nip between said rollers,

passing said sheet of material through a curved passageway between the circumferential surface of said one rotating roller on which it is directed and a stationary elongate concave cylindrical surface facing and spaced by the thickness of said sheet from said circumferential surface of said one rotating roller, movement being thereby imparted to said sheet of material in said passageway on only one side thereof, namely the side facing said one rotating roller, to effect an alignment of macromolecules of said material, and

then passing said sheet of material through the nip between said rollers.

5. Apparatus for processing elastomeric material, in particular plastic, rubber or a mixture thereof to form a sheet of uniform thickness which comprises,



a calender comprising two rollers rotating in opposite directions with a nip between them,

an extruder comprising means for plasticizing and homogenizing said material and an extrusion head having an extrusion aperture defined by two straight parallel outlet surfaces extending the full width of said aperture for extrusion of said material in the form of a sheet having uniform thickness throughout its width,

said extruder being positioned to direct said sheet of extruded material onto a circumferential surface of one roller of said calender at a location circumferentially spaced from the nip between said rollers,

passageway defining means comprising a stationary elongate concave cylindrical surface facing and spaced from the circumferential surface of said one roller between the nip between said rollers and the location at which said sheet of extruded material is directed onto the circumferential surface of said one roller to define a curved passageway for said sheet of extruded material from said extrusion aperture to the nip between said rollers, in which passageway movement is imparted to said sheet of extruded material on only one side thereof, namely the side facing said one roller, to effect an alignment of macromolecules of said material.

4,963,310
PROCESS FOR PRODUCTION OF POLYESTER POLYURETHANE ELASTOMERIC FIBERS

Hideyuki Mitamura; Yoshikazu Arimatsu; Katsuya Tani, all of Obtsu, and Kenichi Katsuo, Tsuruga, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 10,043, Feb. 2, 1987, abandoned. This application Nov. 4, 1988, Ser. No. 267,663
Claims priority, application Japan, Feb. 4, 1986, 61-22446
Int. Cl.[5] D01F 6/00
U.S. Cl. 264—205 6 Claims

1. A process for the production of polyester polyurethane elastomeric fibers which comprises the steps of:

reacting a polyester diol with an excess molar amount of an organic diisocyanate to prepare a urethane prepolymer having terminal isocyanate groups at both ends thereof,

extending the chain of the prepolymer with a bifunctional active hydrogen compound and 0 5 to 10.0 mole % of a diaminosilyl compound based on the total amount of the bifunctional active hydrogen compound during or after preparation of the prepolymer to obtain a polyurethane,

spinning the polyurethane into fiber, and

crosslinking the polyurethane during or after spinning.

4,963,311
POLYAMIDE/POLYESTER GRAFT COPOLYMER FIBERS AND METHOD OF PREPARING SAME

Shaul M. Aharoni, Morris Plains, and Robert C. Morgan, Summit, both of N.J., assignors to Allied-Signal, Morris Township, N.J.

Continuation of Ser. No. 133,268, Dec. 17, 1987, abandoned, which is a continuation of Ser. No. 79,151, Dec. 6, 1984, abandoned. This application Jun. 5, 1989, Ser. No. 361,461
Int. Cl.[5] D01D 5/12; D01F 1/02; B29C 47/88
U.S. Cl. 264—210.8 32 Claims

1. A process for forming polyamide/polyester graft copolymer fibers rich in polyamide, wherein the polyamide and polyester are each melt processible and of fiber-forming molecular weight, which process comprises the steps of:

(a) intimately mixing in the melt a polyamide having amine end groups and a derivatized polyester component selected from the group consisting of:

(a) (i) a polyester component containing recurring aromatic or cycloaliphatic diacyl moieties and aliphatic or cycloaliphatic dioxy moieties in the polymeric backbone and aryl ester end-groups of the formula —C(O)OR wherein R is aryl or alkylaryl; and (ii) a polyester component prepared by masterbatching a polyester containing recurring aromatic or cycloaliphatic diacyl moieties, and aliphatic or cycloaliphatic dioxy moieties in the polymeric backbone and carboxy end-groups and one or more phosphite ester compounds for a time, at a temperature and with an amount of said phosphite ester compounds sufficient to esterify all or a portion of the carboxy end-groups of said polyester,

in proportions giving a continuous polyamide phase, and for a time and at a temperature sufficient to graft a substantial proportion of the esterified carboxy end-groups onto the polyamide;

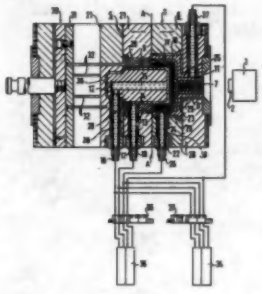
(b) spinning the grafted mixture of step (a) into a fiber; and

(c) drawing the spun fiber.

4,963,312
INJECTION MOLDING METHOD FOR PLASTIC MATERIALS

Fritz Müller, Neur Wasen 6, 7118, Ingelfingen-Criesbach, Fed. Rep. of Germany

Filed Mar. 24, 1989, Ser. No. 328,476
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3811112
Int. Cl.[5] B29C 45/73
U.S. Cl. 264—327 3 Claims



1. An injection molding method for plastic materials, comprising the steps of:

providing an injection mold defining a cavity;

raising the temperature of the injection mold above the melting point of the plastic material before injecting the plastic material by circulating a heat carrier through the injection mold;

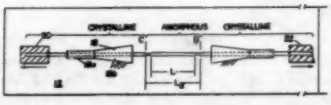
shutting off the flow of the heat carrier through the injection mold upon injection of plastic material into the injection mold; and

cooling the injection mold to a temperature below the freezing point of the plastic material by circulating the heat carrier after the cavity is filled with injected plastic material.

4,963,313
BALLOON CATHETER

Richard A. Noddin, Holliston; Arthur R. Madenjian, Waltham, and Ralph J. Barry, Jr., Hudson, all of Mass., assignors to Boston Scientific Corporation, Watertown, Mass.

Filed Nov. 30, 1987, Ser. No. 126,769
Int. Cl.[5] B29D 22/00; B29C 45/00
U.S. Cl. 264—573 11 Claims



1. A method of forming an inflatable medical balloon catheter device comprising

(a) providing a tube of a selected resin of wall thickness and diameter suitable for being formed into a balloon, said tube having at least a first region crystallized to render it dimensionally stable under heated conditions,

(b) selectively heating to drawing temperature a defined second region of said tube disposed at an end of the portion of the tube from which the balloon is to be formed, between said portion of tube and said first region,

(c) applying tension in opposite directions to respective ends of said heated region to draw the second region to a

smaller diameter, thereby providing a preform having, at the end of said portion of tube, a tapered, relatively small diameter region comprised of material that has substantially no crystallization or molecular orientation,

(d) thereafter heating said tubular preform to blowing temperature and, while heated, forming a balloon by drawing and blowing said preform including said tapered region, and

(e) mounting said balloon on a catheter to form a balloon catheter device,

said step of preforming said tapered end region enabling the corresponding section of the blown balloon to have a separately controllable thickness profile.

4,963,314

GOLF SWING INSTRUCTIONAL DEVICE

George Gering, 8 Robbins La., Short Hills, N.J. 07078, and Jay Benenson, 159 Millburn Ave., Millburn, both of N.J. 07041

Continuation of Ser. No. 297,341, Jan. 17, 1989, abandoned. This application Jan. 30, 1990, Ser. No. 474,636

Int. Cl.[5] A63B *69/36*

U.S. Cl. 273—183 R 8 Claims

1. An instructional device for improving the golf swing comprising means for sensing the sound of a golf club striking a ball, means for generating an actuation pulse in response to the sensing of the sound of the ball being struck, means for generating a series of clock pulses in response to said actuation pulse, selection means having a plurality of outputs and an input, said input being operably connected to receive said clock pulses, said selection means randomly selecting one of said plurality of outputs, in response to said clock pulses, a first plurality of visually distinctive energizable indicia, means for receiving said actuation pulse and for operably connecting said indicia with said random selection means to energize one of the said indicia associated with the randomly selected output for the duration of said actuation pulse.

4,963,315

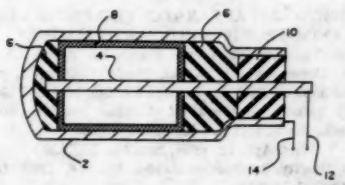
LOW LEVEL DETECTOR MONITOR

Fred H. Bednar, Pittsburgh, and Kenneth G. Lunz, Blannox, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 105,186, Oct. 6, 1987, Pat. No. 4,853,174, which is a continuation-in-part of Ser. No. 875,912, Jun. 19, 1986, abandoned. This application May 30, 1989, Ser. No. 358,755

Int. Cl.[5] G21C *17/00*; G01T *3/00*

U.S. Cl. 376—254 4 Claims



1. In a method for monitoring the neutron flux in the core of a nuclear reactor by means of a neutron detector which is composed of two electrodes between which a d.c. bias voltage is applied and which has a greater neutron sensitivity when the d.c. bias voltage is applied with one polarity than with the opposite polarity, the improvement comprising:

operating the nuclear reactor at a power level close to zero;

applying a d.c. bias level with the one polarity between the detector electrodes and measuring the neutron-induced current flowing through the detector electrodes;

increasing the nuclear reactor operating power level; and

reversing the polarity of the bias voltage applied between the electrodes and continuing to measure the neutron-induced current flowing through the detector electrodes.

4,963,316

FUEL ROD FOR A NUCLEAR REACTOR FUEL ASSEMBLY

Heinz Stehle, Marloffstein; Hans Weidinger, Nuremberg; Eckard Steinberg, Erlangen, and Friedrich Garzarolli, Hoechstadt-Aisch, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 21, 1988, Ser. No. 222,268

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1987, 3724145; Feb. 15, 1988, 3804724

Int. Cl.[5] G21C *3/20*

U.S. Cl. 376—416 12 Claims

1. Fuel rod for a nuclear reactor fuel assembly, comprising a cladding tube having an outer surface and a given total wall thickness, nuclear fuel disposed in said cladding tube, said cladding tube being formed of a first zirconium alloy having alloy components of from 1.2 to 2% by weight of tin, 0.07 to 0.2% by weight of iron, 0.05 to 0.15% by weight of chromium, 0.03 to 0.08% by weight of nickel, 0.07 to 0.15% by weight of oxygen, and a total percent by weight for the alloy components of iron, chromium and nickel in a range of from 0.18 to 0.38% by weight, and a surface layer disposed on said outer surface of said cladding tube being formed of a second zirconium alloy having a layer thickness in a range of from 5 to 20% of said given total wall thickness of said cladding tube, said second zirconium alloy being formed of at least one alloy component from the group consisting of iron, chromium, nickel and tin having a total percentage by weight of the alloy components of said group of from 0.4 to 1% weight.

4,963,317

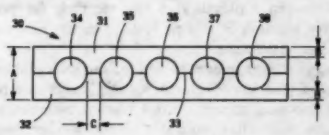
HIGH LOADING URANIUM FUEL PLATE

Thomas C. Wiencek, Bolingbrook; Robert F. Domagala, Indian Head Park, and Henry R. Thresh, Palos Heights, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 13, 1989, Ser. No. 406,950

Int. Cl.[5] G21C *3/00*

U.S. Cl. 376—422 38 Claims



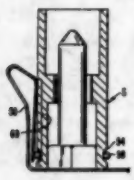
1. Method of producing a high loading uranium fuel plate which comprises enclosing a meat containing structured uranium compound between a pair of ductile metal cladding plates in face-to-face relationship wherein said metal cladding plates contain separate recesses for enclosing said meat and subjecting the resulting assembly to hot isostatic pressing under conditions sufficient to diffusion bond said cladding plates together to provide a resulting fuel plate having uniform cladding and uniform high fuel loading.

4,963,318

SPRING LOCK WASHER FOR TIE ROD NUTS

Eric B. Johansson, and Michael V. Curulla, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Apr. 24, 1989, Ser. No. 342,067
Int. Cl.[5] G21C 3/32
U.S. Cl. 376—446 3 Claims



1. In the combination of a nuclear fuel bundle including a lower tie plate defining a first matrix of fuel rod support locations and a second matrix of coolant inlet apertures;

an upper tie plate defining a corresponding matrix of fuel rod support locations and having a second matrix for the outflow of water and generated steam;

a plurality of fuel rods supported on said lower tie plate and extending to and through said upper tie plate for side-by-side upstanding support between said upper and lower tie plate;

a channel surrounding said fuel rods and extending from said lower tie plate to said upper tie plate to confine fluid flow within said bundle between said tie plates for the controlled flow of water coolant and the generation of steam;

a plurality of said fuel rods having first and second threaded ends to form tie rods for maintaining said upper and lower tie plate in spaced apart relation for maintenance of said fuel rods to said fuel bundle;

said lower tie plate including threaded tie rod receiving apertures complementary to the threading at the bottom of said tie rods whereby a plurality of tie rods may be threaded to said lower tie plate;

said upper tie plate including apertures for permitting the threaded upper end of said tie rods to extend upwardly and through said upper tie plate to permit hex nuts threaded to said upper tie plate to be threaded over the upper end of said tie rods to retain said upper tie plate in place;

a lock washer member captured between the bottom of said threaded bolts and the upper surface of said upper tie plate, said lock washer member including means extending between a plurality of said tie rods for preventing relative rotation of said tie rods to secure said tie rods to said lower tie plate;

and tangs for engagement to said nuts to lock said bolts from rotation, the improvement to said tangs comprising at least one tang at said tie rod washer member, said tang radially protruding from said tie rod washer member;

said tang formed from spring material and bent in an inverted U configuration with a first leg of said U extending from said tie rod surrounding washer member and a second and distal end of said U extending to a position of interference with the side of said hex nut;

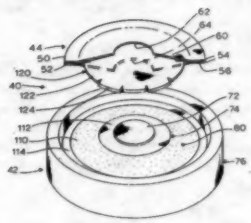
said inverted U configured to bend within the elastic limit whereby bias of said interfering tang member can occur towards and away from said bolt to permit assembly and disassembly of said bolt from the threaded end of said tie rod.

4,963,319

THERMIONIC CONVERTER EMITTER SUPPORT ARRANGEMENT

Daniel T. Allen, La Jolla, Calif., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Division of Ser. No. 376,071, Jul. 6, 1989, Pat. No. 4,927,599.
This application Feb. 15, 1990, Ser. No. 480,462
Int. Cl.[5] G21D 7/00
U.S. Cl. 376—463 4 Claims



1. A method for constructing a support structure in a thermionic converter to support an emitter-holding spring structure on a housing, and to transfer heat between the spring structure and housing while electrically isolating the spring structure from the housing, comprising:

forming a cavity in the front face of a metal main support that has an axis, with the cavity having walls extending in a forwardly-radially outward direction, but at an angle A less than 45° from a direct radial direction;

coating the walls of said cavity with a plurality of sublayers of ceramic, with first and last sublayers that include metal and ceramic and a middle sublayer substantially solely of ceramic, to form a ceramic layer;

placing a metal spring-engaging element having a rear surface substantially conforming to the middle of the front surface of said ceramic layer, so said element rear surface lies on said ceramic layer, to form a sandwich of said ceramic layer between said main support and said element;

hot pressing said sandwich to form a bond between said ceramic layer and said main support, and between said ceramic layer and said element;

machining said hot pressed sandwich to form a forward surface of said ceramic layer even with adjacent forward surfaces of said main support and of said spring engaging element.

4,963,320

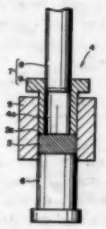
METHOD AND APPARATUS FOR PRODUCING ANISOTROPIC RARE EARTH MAGNET

Makoto Saito, Nagoya; Teruo Watanabe, Aichi; Shinichiro Yahagi, Ohbu; Yasuaki Kasai; Norio Yoshikawa, both of Nagoya; Yutaka Yoshida; Toshiya Kinami, both of Tokai, and Hiyoshi Yamada, Iwakura, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Aichi, Japan

Filed Apr. 11, 1990, Ser. No. 507,438
Claims priority, application Japan, Apr. 14, 1989, 1-95600; Jul. 31, 1989, 1-198172
Int. Cl.[5] C22C 32/00
U.S. Cl. 419—12 20 Claims

1. A method for producing an anisotropic rare earth magnet from a compacted material with magnetic isotropy, which is

characterized by extruding the compacted material into a required form having a ring-shaped section at the same time of



applying compressive stress on a free surface of said compacted material.

4,963,321

SURFACE REFINED SINTERED ALLOY AND PROCESS FOR PRODUCING THE SAME AND COATED SURFACE REFINED SINTERED ALLOY COMPRISING RIGID FILM COATED ON THE ALLOY

Takeshi Saitoh; Tuyoshi Saito; Mitsuo Ueki, all of Kawasaki; Hisashi Suzuki, Tokyo, and Keiichi Kobori, Kawasaki, all of Japan, assignors to Toshiba Tungaloy Co., Ltd., Kawasaki, Japan

Division of Ser. No. 320,059, Mar. 7, 1989. This application Oct. 19, 1989, Ser. No. 424,185

Claims priority, application Japan, May 13, 1988, 63-116351; Sep. 27, 1988, 63-241268

Int. Cl.[5] G22F 7/00

U.S. Cl. 419—13 3 Claims

1. A process for producing a surface refined sintered alloy with a burnt surface, comprising 75 to 95% by weight of a hard phase containing Ti, C and N as the essential components and comprising at least one of Zr, Hf, V, Nb, Ta, Cr, Mo and W and the balance of the alloy comprising a binder phase composed mainly of Co and/or Ni and inevitable impurities from a powdery mixture comprising at least one powder of carbides, nitrides of the metals of the group *4b*, *5b*, *6b* of periodic table and mutual solid solutions of these and powder mainly composed of Co and/or Ni via a sintering step, wherein the temperature and the atmosphere in said sintering step are controlled such that the atmosphere is a vacuum or an atmosphere of an inert gas in the first temperature region of 1300° C. or lower, nitrogen gas atmosphere of 0.1 to 20 Torr in the second temperature range over 1300° C., and further the nitrogen pressure in said second temperature region is made higher as the temperature is higher.

4,963,322

PROCESS FOR THE PRODUCTION OF GOOD FATIGUE STRENGTH ALUMINUM ALLOY COMPONENTS

Jean-Francois Faure, Voiron, France, assignor to Pechiney Recherche Groupement d'Interet Economique, Paris, France

Filed Sep. 20, 1989, Ser. No. 409,694

Claims priority, application France, Sep. 26, 1988, 88 12982

Int. Cl.[5] B22F 4/00

U.S. Cl. 419—33 6 Claims

1. Process for the production of aluminum alloy components retaining a good fatigue strength after being kept hot for a long time, containing by weight 11 to 26% silicon, 2 to 5% iron, 0.5 to 5% copper, 0.1 to 2% magnesium and up to minor additions of nickel and/or cobalt, wherein said alloy also contains 0.1 to 0.4% zirconium and 0.5 to 1.5% manganese: comprising the steps of atomizing the alloy in the molten state and subjecting it to a fast solidification; and shaping the product obtained into the components of at least about 148 MPa.

4,963,323

HIGHLY CORROSION-RESISTANT ZIRCONIUM ALLOY FOR USE AS NUCLEAR REACTOR FUEL CLADDING MATERIAL

Yutaka Matsuo, Tokyo; Yoshitaka Suda, Oyama, and Nobuo Suda, Omiya, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 72,556, Jul. 13, 1987, abandoned. This application Jan. 20, 1989, Ser. No. 300,256

Claims priority, application Japan, Jul. 29, 1986, 61-178441; Jan. 22, 1988, 63-12323

Int. Cl.[5] C22C 16/00

U.S. Cl. 420—422 4 Claims

1. A corrosion resistant zirconium alloy for uses as a nuclear reactor fuel cladding material consisting essentially of on a weight % basis

0.2–1.15% Sn,

0.19–0.6% Fe,

0.07–0.4% Cr,

the balance being Zr and incidental impurities, provided that the content of nitrogen in the form of incidental impurities is no more than 60 ppm.

4,963,324

COLORIMETRIC DOSIMETER

Wolfgang May, Reinfeld, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,319

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1987, 8711788

Int. Cl.[5] G01N 21/78

U.S. Cl. 422—60 5 Claims

1. A colorimetric dosimeter comprising:

an elongated indicator housing openable at one end and having an inner wall surface defining an interior space extending along the length thereof;

said housing being partitioned into a first portion starting at said one end and a second portion following behind said first portion;

a strip indicator defining a high-sensitivity region and being disposed in said first portion so as to conjointly define a clear through diffusion passage with said inner wall surface in said first portion which extends to said second portion; and,

a granular indicator defining a low-sensitivity region and being disposed in said second portion.

4,963,325

SWAB EXPRESSOR IMMUNOASSAY DEVICE

Donald J. Lennon, Hopedale, and Paul B. Foster, Quincy, both of Mass., assignors to Hygeia Sciences, Inc., Newton, Mass.

Filed May 6, 1988, Ser. No. 191,158

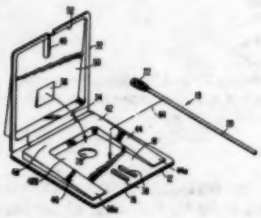
Int. Cl.[5] G01N 1/00; B01L 3/00

U.S. Cl. 422—61 6 Claims

1. A disposable, pre-packaged device for conducting an immunoassay procedure to detect an immunoreactive test

analyte wherein a fluid material containing an immunoreactive test analyte or an immunocomposite formed from such a test analyte is initially gathered in an absorbent mass, the absorbent mass with said fluid material therein is pressed toward a surface of a porous capture element capable of collecting the test analyte or said immunocomposite and the absorbent mass is thus squeezed to thereby express said fluid material and bring the expressed fluid material and its contents into intimate contact with the capture element where the test analyte or immunocomposite formed therefrom are collected and the test analyte detected to indicate a positive result, said device comprising:

a first holder member including structure for supporting and positioning a said capture element;



a second holder member hingedly mounted on said first holder member and including structure for supporting and positioning an absorbent mass containing said fluid material in a position adjacent the capture element; and

a cover member hingedly mounted on said second holder member, said cover member including abutment structure configured and positioned to protrude toward the absorbent mass and contact abutment structure and the second holder member and press the mass against the capture element to thereby express fluid from the absorbent mass and cause the expressed fluid and its contents to come into contact with the capture element when said second holder member is mounted on the first holder member and the cover member is mounted on the second holder member.

4,963,326

PROTECTIVE DEVICE FOR CAPILLARY TUBELETS

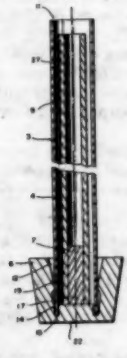
Gunter Eberle, Tuttlingen, Fed. Rep. of Germany, assignor to Firma Andreas Hettich, Tuttlingen, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 280,784

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1987, 8716160[U]

Int. Cl.[5] B01L *9/06, 11/00;* **B04B** *5/02*

U.S. Cl. 422—101 **4 Claims**



1. A combination of a capillary tubelet having a closed end and an open end and a protecting device for protecting said capillary tubelet from breakage or preventing danger of infection if said tubelet should break during centrifuging of blood, wherein said combination is placed on a disk of a centrifuge and pointed radially outwardly from the rotation axis of said disk in a manner such that said closed end of said capillary tubelet is directed toward a peripheral wall of said disk, said protecting device comprising;

a protective tube (4) having open ends; and

a stopper (6) disposed against said peripheral wall of said disk,

said capillary tubelet being contained within said protective tube and supported by said stopper, said stopper having an inner bore (12) with an annular groove (14), said groove receiving one of said open ends of said protective tube, and a projection extending from said annular groove into a portion of said protective tube at said one of said open ends,

said projection providing a support for said closed end of said capillary tubelet.

4,963,327

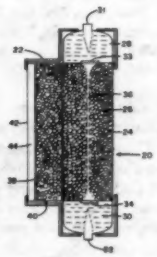
OXYGEN GENERATING MODULE

Donald H. Russell, Cherry Hill, N.J., assignor to Z-Gard, Inc., Kansas City, Mo.

Filed Mar. 23, 1988, Ser. No. 173,113

Int. Cl.[5] A62B *7/08, 21/00, 23/02*

U.S. Cl. 422—120 **14 Claims**



1. A multi-chamber permselective apparatus for providing oxygen enriched filtered air matched to a range of breathing rates, comprising

a first chamber containing microcapsules comprising an oxygen generating compound as a core material and a coating which is moisture swellable but not soluble, said coating slowly exposing said core material to moisture in respired air, said core material reacting with the moisture and generating oxygen;

a second chamber containing a solid carbon dioxide absorber for absorbing carbon dioxide from respired air;

a third chamber containing an aqueous solution of a mildly acidic salt and a nonionic surfactant;

a fourth chamber containing aqueous hydrogen peroxide and a nonionic surfactant,

said chambers being made from a semi-permeable fabric, said fabric preventing fluid penetration under normal pressure but allowing fluid to pass through under moderate overpressure,

a first pressure means comprising a first plunger and a first frangible disc, said first plunger being attached to said third chamber and said first frangible disc separating said aqueous solution of mildly acidic salt from a porous wall of said first chamber, a first level of oxygen generation being activated by depressing said first plunger to rupture said first frangible disc, wherein subsequent to said rupture of said first frangible disc a repeated depression of said first plunger resulting from a first breathing rate

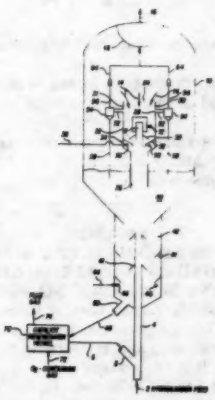
causes an increase of pressure, thereby increasing a flow of said aqueous solution of mildly acidic salt through said porous wall and into said first chamber

a second pressure means comprising a second plunger and a second frangible disc, said second plunger being attached to said fourth chamber and said second frangible disc separating said aqueous hydrogen peroxide from said porous wall of said first chamber, a second level of oxygen generation being activated by depressing said second plunger to rupture said second frangible disc, wherein subsequent to said rupture of said second frangible disc a repeated depression of said second plunger resulting from a second breathing rate causes an increase of pressure, thereby increasing a flow of said aqueous hydrogen peroxide to pass through said porous wall and into said first chamber.

4,963,328
SHORT CONTACT TIME FLUID CATALYTIC CRACKING APPARATUS

James H. Haddad, Princeton Junction, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 3,677, Jan. 15, 1987, Pat. No. 4,793,915. This application Dec. 9, 1988, Ser. No. 282,163
Int. Cl.[5] F27B *1/20*
U.S. Cl. 422—144 13 Claims



1. A fluid catalytic cracking apparatus comprising:

(a) an elongated tubular fluid catalytic cracking riser having an upstream end and a downstream end;

(b) a deflector baffle, said downstream end of said riser being located below said deflector baffle;

(c) a stripping vessel comprising sidewalls, a side opening, a top opening and a bottom opening, said deflector baffle being located within said stripping vessel, said deflector baffle being spaced from said riser downstream end and said stripping vessel;

(d) first means for stripping catalyst defined by a lower portion of said stripping vessel;

(e) first means for injecting stripping gas into said first stripping means;

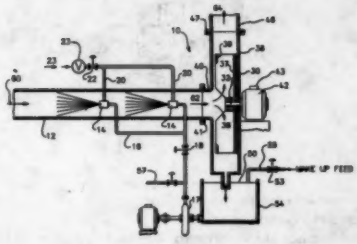
(f) a disengaging vessel, said stripping vessel being located within said disengaging vessel said top opening providing a passageway from the interior of the disengaging vessel to the interior of the stripping vessel; and

(g) a cyclone located outside said stripping vessel, a conduit attached to said stripping vessel at said side opening and attached to said cyclone, said inlet conduit being in open communication with said side opening and said cyclone.

4,963,329
GAS REACTING APPARATUS AND METHOD

J. Stuart Burgess, London; Donald R. Spink, Waterloo, and Jerry Y. Stein, Thornhill, all of Canada, assignors to Turbotak Inc., Waterloo, Canada

Continuation-in-part of Ser. No. 20,953, Mar. 2, 1987, Pat. No. 4,865,817. This application Sep. 13, 1988, Ser. No. 243,720
Int. Cl.[5] C01B *17/00*
U.S. Cl. 422—168 23 Claims



1. A gas reacting apparatus for the wet mass transfer of solute gases from a process gas stream into a reaction medium, comprising:

(a) an elongated conduit means having an inlet end and an outlet end to permit a process gas stream to enter through said inlet end, flow along said conduit means and pass out through said outlet end;

(b) plurality of dual-fluid spray means spaced in series within said conduit means for the formation of a plurality of spray contact zones of uniformly-distributed fine spray having a droplet size of from about 5 to about 100 microns of a reacting medium wherein intimate contact between the reacting medium and the process gas stream is effected to remove solute gases from the process gas stream; and

(c) fan means connected in fluid flow communication with said outlet end of said conduit means for coalescing liquid droplets in the gas stream passing to said outlet end of said conduit means and including a drive means for operating said fan means at a relatively low speed to effect the coalescence, means defining a gas exhaust passage for clean gas separated by said fan means and means defining a passage for discharging liquid or slurry separated from the gas stream by said fan means as a result of the coalescence.

19. A gas contact chamber apparatus, comprising:

an enclosure having an inlet for a gas stream located in an upper portion of said enclosure, an outlet for a gas stream also located in an upper portion of said enclosure and a gas flow path between said inlet and said outlet,

a baffle extending vertically downwardly from an upper closure to and within said enclosure and normal to the gas flow path for a sufficient distance to cause the gas stream entering said enclosure through said inlet to contact an inlet side of said baffle and then to pass under said baffle at a relatively lower velocity to said outlet, and

at least two dual-fluid spray means one being located adjacent said inlet and co-current to the gas flow path to form a uniformly-distributed fine spray of contact medium impinging on the inlet side of said baffle, and one being located adjacent said outlet and countercurrent to the gas flow path to form a uniformly-distributed fine spray of contact medium impinging on the outlet side of said baffle.

4,963,330
METHOD AND APPARATUS FOR TREATING CONTAMINATED GASES

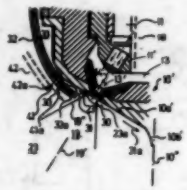
Lars-Erik Johansson, and Per-Gunnar Jacobsson, both of Växjö, Sweden, assignors to Fläkt AB, Sweden

Continuation-in-part of Ser. No. 129,874, Dec. 4, 1987, abandoned, which is a continuation of Ser. No. 852,635, Apr. 16, 1986, abandoned. This application May 30, 1989, Ser. No. 358,152

Claims priority, application Sweden, Apr. 16, 1985, 8501851

Int. Cl.[5] B01D 53/34; B05B 1/28

U.S. Cl. 422—168 24 Claims



1. A contact reactor, comprising:

(a) contact reactor chamber;

(b) a chamber inlet through which a medium laden with gaseous contaminants is introduced into the chamber;

(c) an outlet through which cleansed medium leaves the chamber;

(d) a media-mixing nozzle assembly including an outer wall surface and internal means for mixing a first medium in the form of a gas with a second medium in the form of a liquid/absorbent suspension and introducing the resultant medium mixture into the chamber through a nozzle orifice in the form of a jet of medium;

said nozzle assembly including a plurality of nozzle orifices arranged in the outer wall surface in a substantially circular pattern;

means for creating around the nozzle assembly a converging boundary media-layer for contacting each of the jets of medium leaving the respective nozzle orifice and preventing said jets of medium from flowing back to the wall surface of the nozzle assembly, said creating means comprising means defining a slot located adjacent to but externally of the substantially circular pattern of nozzle orifices for directing the boundary media-layer as a curtain towards a center line of the nozzle assembly; and

said nozzle assembly including pointed means located centrally with respect to said circular pattern of nozzle orifices and said creating means projecting from the wall surface into the boundary media-layer for contacting the boundary medialayer and deflecting the direction of the boundary media-layer towards the center line of nozzle assembly.

4,963,331
OZONE GENERATING TUBE

Kenneth W. Mouw, 2401 Oberlin Rd., Yreka, Calif. 96067

Filed Feb. 26, 1990, Ser. No. 485,175

Int. Cl.[5] B01J 19/08

U.S. Cl. 422—186.18 5 Claims

1. Ozone generating means comprising

a sealed glass tube having forward and rearward ends and also having a gaseous filling which when subjected to high voltage produces a radiation of energy through the wall of the tube,

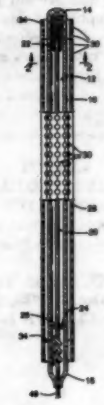
an elongated electrical conductor disposed lengthwise in said tube and having forward and rearward ends,

said forward end of said conductor having a projecting end in sealed relation with the forward end of said tube and arranged for connection to a source of high voltage,

said conductor extending axially in said tube whereby to subject said gaseous filling to high voltage and provide electrical communication to the exterior of the tube,

an encircling perforated grid surrounding said tube and being arranged to form a shield for energy radiating from said tube to produce ozone,

said grid comprising a metal member larger in diameter than said tube whereby the inner diameter thereof is larger than



the outer diameter of said tube to form a space therebetween,

an electrically conducting cap having an open end receiving a forward end of said tube and being integrally secured thereto,

and a male adapter integrally mounted on said cap arranged to threadedly attach said tube to and detach it from an ozone generator manifold.

4,963,332
METHOD FOR THE CATALYTIC REMOVAL OF NITROGEN OXIDES FROM EXHAUST GASES BY MEANS OF A REDUCING AGENT

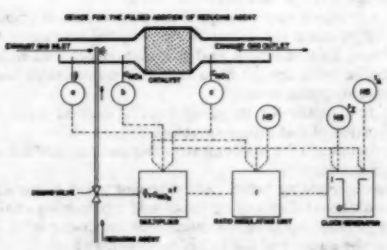
Reinhold Brand; Bernd Engler, both of Hanau; Peter Kleine-Moellhoff, and Edgar Koberstein, both of Alzenau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 25, 1989, Ser. No. 384,754

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1988, 3825206

Int. Cl.[5] C01B 21/00; B01J 8/00; G01N 21/00

U.S. Cl. 423—235 5 Claims



1. A method of removing nitrogen oxides contained in exhaust gases with a temperature from 0°–600° C. comprising treating said exhaust gases with a reducing agent in the pres-

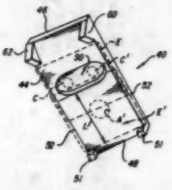
ence of a nitrogen oxide reducing catalyst having active centers at a stoichometric ration between the concentration of reducing agent and the initial concentration of nitrogen oxide, dosing the reducing agent into the exhaust gas to be treated in a controlled discontinuous manner in such a manner to avoid adsorption of the reducing agent and blocking of the active centers of said catalyst by said reducing agent, said dosing being in pulses t_A of 0.01 to 15,000 sec. duration with stop intervals t_Z therebetween of 0.1 to 15,000 sec. duration.

4,963,333

UNIVERSAL EVAPORATION COVER

James D. Shaw, and Martin F. Muszak, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 2, 1989, Ser. No. 346,205
Int. Cl.[5] B01L *3/00*
U.S. Cl. 422—99 **4 Claims**



1. In an evaporation cover for an incubator that receives both colorimetric and potentiometric test elements, the cover including a body portion of sufficient length to cover at least a portion of a test element in the incubator, said body portion having (a) a sealing surface to contact a test element, (b) a recess in said sealing surface to provide clearance for liquid drops sitting on a potentiometric test element, (c) a front edge, (d) a rear edge and (e) two side edges; said body portion length extending generally parallel to said side edges; the improvement wherein said body portion length is extended beyond said recess towards said rear edge, by an amount that is sufficient to allow a colorimetric element to be pushed beyond said recess and still have its wetted area be sealingly covered, and further including means on said body portion for camming said body portion away from a test element that is entering said incubator.

4,963,334

HIGH TEMPERATURE HEAT PIPE CORACLE AND PROCESS

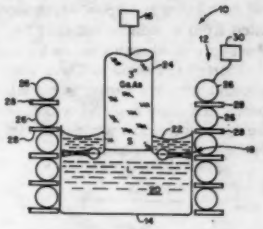
Brian S. Ahern, Boxboro, and Robert M. Hilton, Chelmsford, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 14, 1989, Ser. No. 393,169
Int. Cl.[5] C30B *15/22, 15/24*
U.S. Cl. 422—249 **12 Claims**

1. A heat pipe coracle for use in a crystal growth apparatus, said heat pipe coracle comprising:

a coracle ring, said coracle ring being composed of a material resistant to attack from a melt of the crystal growth apparatus and having a density less than the melt so as to float upon said melt, said coracle ring being a torrus having a central opening therethrough, said central opening being of a diameter approximately equal to that of a single crystal pulled from the melt through said central opening, the single crystal being in sliding contact with said coracle ring to insure uniform heat distribution perpendicular to the vertical axis at the interface between the single crystal and the melt, and

means for centering said coracle ring within a crucible of said crystal growth apparatus, said means for centering fixedly attached to said coracle ring and resistant to attack from said melt, said means for centering being in sliding contact with the wall of the crucible so that said heat pipe



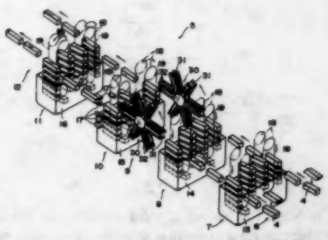
coracle can float upon said melt and move in a vertical direction.

4,963,335

STERILIZING APPARATUS

Takuya Adachi, Koshigaya; Sukenori Ito, Fuchu; Akihiro Shiosaka, Koshigaya; Atsushi Yuzawa, Kasukabe; Masaaki Takada, Sugito; Kiichiro Okano, Chiba; Masaru Kurihara, Kasukabe, and Hiromitsu Uchiyama, Sugito, all of Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Filed May 5, 1989, Ser. No. 347,875
Claims priority, application Japan, May 6, 1988, 63-110037; May 6, 1988, 63-110038; May 6, 1988, 63-110039; Aug. 31, 1988, 63-216847; Feb. 28, 1989, 1-47304; Feb. 28, 1989, 1-47305
Int. Cl.[5] A61L *2/18;* B65B *55/10*
U.S. Cl. 422—302 **19 Claims**



1. A sterilizing apparatus for sterilizing in an aseptic chamber a hollow prism-shaped carton for a beverage container open at both ends until a bottom end of the container is closed, and for drying the carton, the apparatus comprising:

a first carton-supplying station;

a sterilizing station having a tank filled with a sterilizing solution, and conveyor means for sequentially and intermittently conveying cartons supplied from the first carton-supplying station, through the sterilizing solution filled in the tank, while holding the cartons in a state inclined with respect to a horizontal plane;

a first drying station having a drying chamber provided with hot air drying means for drying the sterilized cartons with hot air, and conveyor means for sequentially and intermittently conveying the sterilized cartons through the drying chamber, while holding the cartons in a state inclined with respect to the horizontal plane;

a solution removing station located between the sterilizing station and the first drying station, for removing the sterilizing solution from the sterilized cartons;

said solution removing station having a solution removing device, for operating in synchronism with the carton conveyor means of both the sterilizing station and the first drying station, thereby to convey the cartons sequentially

and intermittently in a plane parallel to the paths in which the cartons are conveyed by both carton conveyor means, said solution removing device having a plurality of thin and long mandrels, arranged radially and equi-angularly separated from each other and upon which sterilized cartons are mounted from a radially outward tip portion; each mandrel being provided with a nozzle for applying aseptic air into the cartons and being inclined, when the nozzle is in a position at which a carton is mounted thereon, at approximately the same angle at which said cartons are held in the conveyor means while in a state inclined with respect to the horizontal plane.

4,963,336

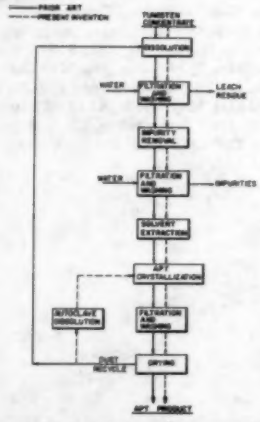
PURIFICATION OF APT

Leo W. Beckstead, Arvada, Colo.; Tom C. Kearns, Donnellson, Iowa, and Eddie C. Chou, Arvada, Colo., assignors to AMAX Inc., New York, N.Y.

Filed Sep. 25, 1989, Ser. No. 412,062

Int. Cl.[5] C01G *41/00*

U.S. Cl. 423—56 **7 Claims**



1. The process for testing a solid ammonium paratungstate (APT) product using a minimum number of process operations which comprises mixing said APT with aqueous ammonia solution containing about 2.5% to about 12%, by weight, NH_3, and autoclaving said mixture at a temperature above the boiling point therefor for a time sufficient to dissolve substantially all of said APT, and recrystallizing solid APT from said solution.

4,963,337

ZEOLITE SSZ-33

Stacey I. Zones, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 7, 1989, Ser. No. 377,358

Int. Cl.[5] C01B *33/34, 35/10*

U.S. Cl. 423—277 **20 Claims**

1. A zeolite having a mole ratio, of an oxide selected from silicon oxide, germanium oxide, and mixtures thereof to an oxide selected from boron oxide or mixtures of boron oxide with aluminum oxide, gallium oxide, or iron oxide, greater than about 20:1, and wherein the amount of boron in the zeolite is greater than 100 parts per million, and having the X-ray diffraction lines of Table 1(a).

4,963,338

PROCESS FOR HETEROGENEOUS SYNTHESIS AND RELATED REACTORS

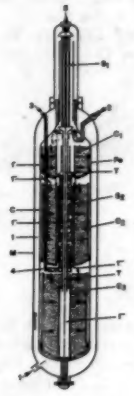
Umberto Zardi, Via Lucino 57, CH-6932, Breganzona, and Giorgio Pagani, Lugano, both of Italy, assignors to Ammonia Casale, S.A. and Umberto Zardi, Lugano, Switzerland

Filed Jun. 30, 1988, Ser. No. 213,369

Claims priority, application Switzerland, Jul. 3, 1987, 02529/87

Int. Cl.[5] C01C *1/04;* C07C *27/06*

U.S. Cl. 423—360 **5 Claims**



1. A process for heterogeneous synthesis wherein synthesis catalyst is distributed in three axial-radial or radial catalytic beds, and the temperature between the beds is controlled by quenching with fresh gas between the first catalytic bed and the second catalytic bed and by indirect cooling of the gas leaving the second catalytic bed with fresh gas heated inside the tubes of a heat exchanger disposed between the second catalytic bed and the third catalytic bed.

4,963,339

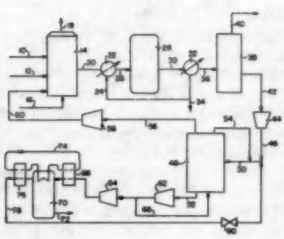
HYDROGEN AND CARBON DIOXIDE COPRODUCTION

Ramachandran Krishnamurthy, Piscataway; Virginia A. Malik, Linden, both of N.J., and Alan G. Stokley, Wokingham, England, assignors to The BOC Group, Inc., New Providence, N.J.

Filed May 4, 1988, Ser. No. 190,281

Int. Cl.[5] B01D *53/04;* C01B *3/24, 31/20*

U.S. Cl. 423—437 **9 Claims**



1. A process of recovering high purity gaseous hydrogen and liquid carbon dioxide comprising:

(a) generating hydrogen from one or more hydrocarbons in a steam reformer;

(b) treating the steam reformer effluent in a shift converter to convert carbon monoxide therein to carbon dioxide;
(c) introducing the shift converter effluent into a hydrogen PSA unit thereby recovering gaseous hydrogen of at least 99.999 percent purity and an effluent stream comprising hydrogen, carbon dioxide, carbon monoxide and methane;
(d) introducing the hydrogen PSA unit effluent stream at a pressure not exceeding 90 psia into a carbon dioxide PSA unit thereby producing a hydrogen-rich stream, a carbon dioxide-rich recycle stream and a carbon dioxide-rich product stream comprising at least 98 percent pure carbon dioxide;
(e) recycling the hydrogen-rich stream to the feed to the steam reformer and concurrently optimizing the steam flow for the combined fresh and recycle feeds in order to increase generation of hydrogen in the reformer and thereby hydrogen production in the hydrogen PSA unit;
(f) recycling the carbon dioxide-rich stream to the feed to the carbon dioxide PSA unit;
(g) passing the carbon dioxide-rich product stream to a means of increasing pressure and thereafter to a means to liquify same under refrigeration and recovering therefrom a high purity liquid product and a waste stream;
(h) recycling the waste stream from said liquifying means to the feed to the carbon dioxide PSA unit; and
(i) withdrawing a portion of the high purity carbon dioxide from an intermediate point of said means of increasing pressure and recycling it to the carbon dioxide PSA unit;
wherein said carbon dioxide pressure swing adsorption (PSA) unit contains at least two adsorbent beds and each adsorbent bed undergoes a cycle comprising pressurization with production of a hydrogen-rich stream, pressure equalization with another adsorbent bed, regeneration to produce a carbon dioxide-rich stream and pressure equalization with another bed, and said recycle stream under pressure in step (i) is utilized as a cocurrent purge to remove from the bed, components of the hydrogen PSA unit effluent that are less strongly adsorbed than carbon dioxide, thereby increasing the amount of carbon dioxide adsorbed in said bed, the purge being carried out prior to regeneration of said bed; and
wherein, the production of high purity gaseous hydrogen is significantly improved at a low cost and there is substantially 100 percent conversion of the carbon content of the hydrocarbon feed to the steam reformer into carbon dioxide.

4,963,340

CYCLIC PROCESS FOR CONVERTING METHANE TO CARBON DISULFIDE

Costandi A. Audeh, Princeton, and Weldon K. Bell, Pennington, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 322,264, Mar. 13, 1989, abandoned. This application Jan. 30, 1990, Ser. No. 473,138

Int. Cl.[5] C01B *31/26*

U.S. Cl. 423—444 **2 Claims**

1. A cyclic process for converting methane to carbon disulfide, said process comprising the steps of:
(i) decomposing methane on a solid carrier in a decomposition zone under conditions sufficient to generate hydrogen and to deposit elemental carbon on said solid carrier;
(ii) transporting the carbon-containing solid carrier from said decomposition zone of step (i) to a carbon/sulfur reaction zone;
(iii) contacting said carbon-containing solid carrier with sulfur in said carbon/sulfur reaction zone under conditions sufficient to convert said elemental carbon and sulfur to carbon disulfide, thereby removing elemental carbon from said carrier; and
(iv) transporting said carrier from said carbon/sulfur reaction zone of step (iii) to said decomposition zone of step (i), and repeating steps (i), (ii) and (iii).

4,963,341

PROCESS FOR DEGRADING HYPOCHLORITE AND SODIUM HYPOCHLORITE

William P. Huxtable, Concord; William L. Griffith, Oak Ridge, and Alicia L. Compere, Knoxville, all of Tenn., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed May 12, 1989, Ser. No. 350,816

Int. Cl.[5] C01D *3/04, 15/04;* C01B *13/00;* B01J *23/00*

U.S. Cl. 423—499 **13 Claims**

1. A process for degrading hypochlorite into chloride and oxygen which comprises contacting aqueous hypochlorite basic solution with a catalyst comprising cobalt oxide and molybdenum oxide disposed on a substrate, said oxides having no spinel formation evident from x-ray diffraction spectra tests.

4,963,342

SOLUTIONS OF PERMONOSULPHURIC ACID

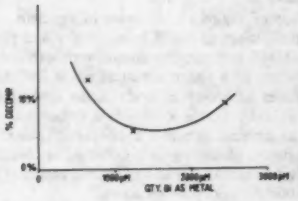
David J. Lapham, Derbyshire, and Nicholas A. Troughton, Cheshire, both of United Kingdom, assignors to Micro-Image Technology Limited, London, England

Filed Jun. 5, 1989, Ser. No. 361,143

Claims priority, application United Kingdom, Jun. 11, 1988, 8813889

Int. Cl.[5] C01B *15/06;* C23G *1/02;* C09K *13/04;* C11D *7/18*

U.S. Cl. 423—513 **12 Claims**



1. A stabilised aqueous mixed permonosulphuric acid and sulphuric acid solution containing a organic 5-valent phosphorus compound sequestrant and a stabilizing quantity of an added metal compound stabilizer, said added metal compound being selected from the group consisting of gallium, germanium, indium, antimony, thallium, bismuth, lead and mixtures thereof.

4,963,343

STABLE $K_2FE_{22}O_{34}$ POTASSIUM FERRITE PHASE

James M. Watson, Monroe, La.; David Crabbe, and Thomas S. Coursen, Jr., both of St. Louis, Mo., assignors to Columbian Chemicals Co., Cobb County, Ga.

Division of Ser. No. 66,232, Jun. 25, 1987. This application Dec. 14, 1987, Ser. No. 132,025

Int. Cl.[5] C01G *49/02*

U.S. Cl. 423—594 3 Claims

1. A composition of matter consisting essentially of $K_2 F_{22}O_{34}$.

4,963,344

METHOD TO ENHANCE NMR IMAGING USING CHELATED PARAMAGNETIC IONS

Heinz Gries; Douwe Rosenbergy; Hanns-Joachim Weinmann; Ulrich Speck; Wolfgang Mutzel, Georg-Alexander Hoyer; Heinrich Pfeiffer, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 20,993, Mar. 2, 1987, abandoned, which is a continuation of Ser. No. 573,184, Jan. 23, 1984, Pat. No. 4,647,447, which is a continuation-in-part of Ser. No. 401,594, Jul. 26, 1982, abandoned. This application Jun. 23, 1989, Ser. No. 370,139

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129906; Jan. 21, 1983, 3302410; Jan. 11, 1984, 3401057

The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.

Int. Cl.[5] H61K *49/00*; G01N *31/00*

U.S. Cl. 424—9 169 Claims

1. A method of imaging body tissue in a patient, comprising subjecting the patient to NMR tomography and prior to performing the NMR tomography administering to the patient an effective amount of a pharmaceutical agent for affecting the relaxation times of atoms in body tissue undergoing NMR diagnosis, whereby image contrast is enhanced, said agent comprising an amount, effective to affect such relaxation times, of a paramagnetic, physiologically compatible chelate complex of an ion of a lanthanide element of atomic numbers 58–70; and a pharmaceutically acceptable carrier.

4,963,345

INJECTABLE LOCAL ANESTHETIC ANTIDOTE

Kim K. Forrest, 2194 Riverside Dr., West Columbia, Tex. 77486

Filed Jul. 18, 1988, Ser. No. 220,160

Int. Cl.[5] A61K *27/00*

U.S. Cl. 424—10 9 Claims

1. An injectable for defeating local anesthetic action, the injectable comprising a pharmaceutical acceptable injectable buffered acidic solution including a vasodilator.

4,963,346

METHOD AND COMPOSITION FOR TREATMENT OR PREVENTION OF DENTAL PLAQUE CALCULUS AND GINGIVITIS

M. Samir Amer, Montecito, Calif., assignor to Amer & Company, Inc., Montecito, Calif.

Filed May 31, 1988, Ser. No. 200,681

Int. Cl.[5] A61K *7/16, 7/26, 31/56*; A01N *45/00*

U.S. Cl. 424—49 29 Claims

1. A composition for the therapeutic or prophylactic treatment of dental plaque, calculus or gingivitis in humans and animals, which composition consists essentially of (1) an active treatment composition consisting essentially of at least about 80% by weight phytosterols, said phytosterols comprising at least about 40% by weight sitosterol, about 20% to about 45% by weight campesterol and about 3% to about 25% by weight stigmasterol, and (2) a normally non-ingested carrier in association with said active treatment composition suitable for delivering said active treatment composition to the oral cavity.

4,963,347

ORAL HYGIENE COMPOSITIONS AND POLYMERS ACTIVE THEREIN

Martyn Humphries, Manchester; Jozef Nemcek; Joseph F. Jaworzyn, both of Cheshire; John B. Cantwell, Merseyside, and John J. Gerrard, Cheshire, all of England, assignors to Imperial Chemical Industries plc, Hertfordshire, England

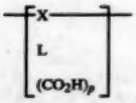
Division of Ser. No. 16,257, Feb. 19, 1987, abandoned, which is a division of Ser. No. 793,763, Nov. 1, 1985, abandoned. This application Jan. 17, 1988, Ser. No. 282,556

Claims priority, application United Kingdom, Nov. 12, 1984, 8428523

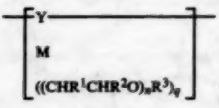
Int. Cl.[5] A61K *7/16*

U.S. Cl. 424—49 19 Claims

1. Process for preventing or inhibiting the adherent deposition of cariogenic or other oral bacteria and plaque formed therefrom on teeth, which process comprises applying to the teeth an oral hygiene composition comprising an effective among of at least one polymer has a molecular weight of at least about 5000 and units of general structure A



and one or more repeating units of general structure B



wherein X, which in the repeating units of structure A may be the same or different, and Y, which is the repeating units of structure B may be the same or different, are unsubstituted hydrocarbyl residues or residues substituted with groups such as hydroxy, alkoxy and halogen provided that the desired properties of the polymer are not adversely effected by such substituents, said residues providing a backbone for the polymer;

R^1, which in the same repeating unit of structure B (when n or q is 2 or more) or in different repeating units of structure B may be the same or different, is hydrogen or methyl;

R^2, which in the same repeating unit of structure B (when n or q is 2 or more) or in different repeating units of structure B may be the same or different, is hydrogen or methyl;

except that R^1 and R^2 in a single unit (CHR^1CHR^2O) cannot both be methyl;

R^3, which in the same repeating unit of structure B (when q is 2 or more) or in different repeating units of structure B may be the same or different, is hydrogen, or a lower alkyl group containing up to 5 carbon atoms, or an acyl groups derived from an alkanoic acid having up to 5 carbon atoms;

n is a number of from 1 to 60;

p is a number of from 1 to 4, and q is a number of from 1 to 4; and wherein each (CH_2H) group is joined via an intermediary or intermediaries L to the hydrocarbon residue X, and in cases where

p is 2 to 4 may be joined by 1 to the same or different carbon atoms of x;

and wherein L represents one or more intermediaries, and wherein L may be the same or different in the repeating units of structure A and is selected from one or more direct links and one or more groups of atoms each group providing a chain of one or more atoms for linking a (Co_2H) group with X, except that more than two (CO_2H) groups cannot be directly linked to the same carbon atom in X;

and wherein each $(CHR^1CHR^2O)_n$ group is joined via an intermediary or intermediaries M to the hydrocarbyl residue Y, and in cases where q is 2 to 4 may be joined to the same or different carbon atoms of Y;

and wherein M represents one or more intermediaries, and wherein M may be the same ox different in the repeating units of structure B and is selected from one or more direct links and one or more groups of atoms each group providing a chain of one or more atoms for lining a $(CHR^1CHR^2O)_n$ group with Y, except that more than two (CHR^1CHR^2O) groups cannot be directly linked to the same carbon atom in Y;

and wherein the ratio of the member of $—CO_2H$ groups to the number of $—CHR^1CHR^2O—$ groups is within the range of from 1:20 to 20:1; and said composition also comprising a pharmaceutically acceptable vehicle for said polymer.

4,963,348

STYLING AGENTS AND COMPOSITIONS CONTAINING THE SAME

Raymond E. Bolich, Jr., Maineville, and Peter M. Torgerson, Washington Court House, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 131,954, Dec. 11, 1987, abandoned. This application Nov. 3, 1989, Ser. No. 433,409

Int. Cl.[5] A61K *7/06, 7/11*

U.S. Cl. 424—71 **18 Claims**

1. A styling agent comprising:

A. an adhesive copolymer having two or more monomers randomly distributed in a substantially linear copolymer chain wherein said copolymer has a single glass transition temperature of from about 0° C. to about 150° C. and a number-average molecular weight of from about 10,000 to about 1,000,000; and wherein said copolymer has a water solubility of less than 0.1% and

B. a volatile diluent selected from the group consisting of hydrocarbons, esters, ethers, amines, alkyl alcohols and silicon derivatives and mixtures thereof and wherein said diluent has a boiling point of from about 99° C. to about 260° C. and a water solubility of less than about 0.2% at 25° C.;

wherein said adhesive copolymer is soluble in said volatile diluent, and the weight ratio of adhesive copolymer to volatile diluent is from about 1:20 to about 5:1.

4,963,349

PERMANENT WAVE SOLUTION

Roger A. Mathews, Newbury Park; Edward R. Moore, Canoga Park, and David W. Cannell, Los Angeles, all of Calif., assignors to Redken Laboratories, Inc., Canoga Park, Calif.

Filed Oct. 4, 1988, Ser. No. 253,860

Int. Cl.[5] A61K *7/09*

U.S. Cl. 424—72 **21 Claims**

1. An aqueous permanent wave solution comprising:

at least one compound for cleaving interprotein disulfide bonds in hair selected from the group consisting of thioglycolates, thiolactates, mercapto compounds and thioglycerol; and

at least one biocompatible 1,3-alkyldiol in the range of from 2 to 7% by weight.

4,963,350

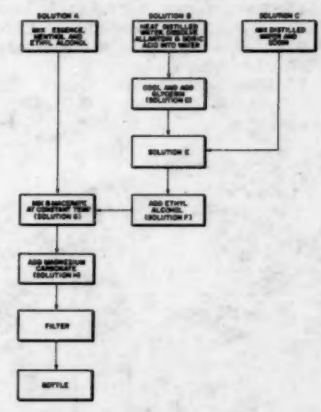
LIQUID SHAVING PRODUCT

Samuel A. Goldstein, Box 275, Westtown, Pa. 19395, and Jose A. P. Alonso, Calle Benajan, 57 "Los Dolores", 3001 Murcia, Murcia, Spain

Filed Jun. 16, 1989, Ser. No. 367,130

Int. Cl.[5] A61K *7/15*

U.S. Cl. 424—73 **10 Claims**



1. A stable soothing hydroalcoholic liquid shaving preparation comprising:

a combined allantoin-boric acid hydrolyzed solution with allantoin in an amount of at least about 0.02% by weight and boric acid in an amount of at least about 2% by weight of the preparation and

glycerine, menthol, ethyl alcohol and perfume,

said glycerine comprising about 3% by weight, said menthol comprising about 0.01% by weight, said ethyl alcohol comprising about 70% by weight and said perfume comprising about 5% by weight of the preparation.

4,963,351

SHAVING AID

William Weston, Wayne, N.J., assignor to BHN Associates, Wayne, N.J.

Filed Dec. 26, 1989, Ser. No. 456,940

Int. Cl.[5] A61K *7/15*

U.S. Cl. 424—73 **6 Claims**

1. A water-soluble particulate composition of free-flowing solids suitable for use in wet shaving consisting essentially of:

(i) from about 78% to about 87% sodium tripolyphosphate hexahydrate containing about 15% to about 22.7% water by weight;

(ii) from about 9% to about 16% mineral oil emollient;
(iii) from about 0.5% to about 3% hydrophilic non-ionic surfactant, and
(iiii) up to about 1.5% of a low viscosity dimethicone, the above percentages for components (i)–(iii) being by weight based upon the total weight of the composition.

4,963,352

SHAVING COMPOSITIONS

David Roberts, 7241 Mission Hill Dr., Las Vegas, Nev. 89113

Continuation-in-part of Ser. No. 149,122, Jan. 27, 1988, Pat. No. 4,917,884. This application Aug. 23, 1989, Ser. No. 397,729
Int. Cl.[5] A61K *7/15*
U.S. Cl. 424—73 19 Claims

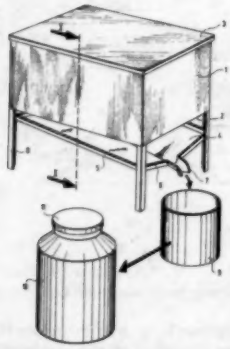
1. An improved shaving composition consisting essentially of unaged diethyleneglycol monoethyl ether, glyoxal, urea, fatty acid and alkanolamine wherein the ratio by weight of alkanolamine to fatty acid is between about 1:2 and about 1:3.

4,963,353

METHOD FOR PREPARING A BIOLOGICAL EXTRACT FOR REGENERATING THE HAIR AND SKIN, AND APPARATUS FOR PERFORMING THE METHOD

Trilochan S. Sidhu, Adam-Vogt-Strasse 8, D-8910, Landsberg-/Lech, Fed. Rep. of Germany

Filed Feb. 3, 1989, Ser. No. 306,642
Int. Cl.[5] A61K *7/06, 7/075, 7/48, 35/84*
U.S. Cl. 424—74 18 Claims



1. A Method for preparing a biological extract for regenerating the hair and the skin, comprising the following steps:
(1) a mixture of comminuted receptacles of non-toxic Basidiomycetes and insect larvae that feed on fungi is left to stand for a period of several hours to several days in a container which is perforated at the bottom, and the liquid composition draining off is collected and conducted into a collecting vessel;
(2) from the collecting vessel, this composition is carried to a vessel that is closable in an airtight manner, in which it is left to stand, closed, for from 2 to 5 days, until a dark-brown color and an intense odor develop;
(3) a skin-compatible alcohol is thereupon added in a quantity sufficient to kill the larvae;
(4) the composition is then left to stand, closed, for from 6 to 15 months; and
(5) then the liquid is separated from the sludge material and mixed with at least one of: a skin-compatible alcohol; a skin-compatible oil.

4,963,354

USE OF TUMOR NECROSIS FACTOR (TNF) AS AN ADJUVANT

H. Michael Shepard, San Francisco, Calif., and James E. Talmadge, Frederick, Md., assignors to Genentech, Inc., So. San Francisco, Calif.

Filed Jan. 21, 1987, Ser. No. 7,075
Int. Cl.[5] A61K *37/02, 39/39*
U.S. Cl. 424—85.1 8 Claims

1. A method for enhancing an immune response comprising administering to an animal (a) a substance against which it is desired to raise an immune response, said substance being a tumor antigen, and (b) an adjuvant effective amount of a tumor necrosis factor; provided, however, that when the animal bears a tumor the TNF is not cytotoxic for the tumor.

4,963,355

PRODUCTION OF ANTIBODY CATALYSTS

Peter S. Kim, Brookline, Mass., and Neville R. Kallenbach, New York, N.Y., assignors to Igen, Inc., Rockville, Md.

Continuation-in-part of Ser. No. 877,273, Jun. 23, 1986, Pat. No. 4,792,446. This application Jun. 19, 1987, Ser. No. 64,239
The portion of the term of this patent subsequent to Dec. 20, 2005, has been disclaimed.
Int. Cl.[5] C12Q *1/44;* A61K *39/00;* C07F *9/40, 9/65*
U.S. Cl. 424—85.8 44 Claims

1. Process for producing an antibody catalyst for a chemical reaction, which comprises:
(1) identifying a substrate for said chemical reaction, said substrate represented by formula

$$R_1—X—R_2;$$

(2) selecting a hapten which corresponds to said substrate, said hapten represented by formula

$$R_1'—Y(=O)—R_2'$$

wherein X represents one or more nuclei and associated bonds which contain O, S, N or C and which comprise the portion of the substrate molecule to be altered in the chemical reaction and Y represents one or more nuclei and associated bonds which contain N, C or P and which comprises the portion of the hapten molecule corresponding to the portion of the substrate molecule to be altered in the chemical reaction and wherein Y is related to X such that Y has a higher valence state and one or more bonds than X, and wherein Q represents one or more substituents selected from the group consisting of (a) positively charged substituents, (b) negatively charged substituents, (c) polar substituents, (d) non-polar substituents, and (e) substituents of substantial bulk, and wherein Q can contain a group capable of linking the hapten to the carrier, and wherein R_1, R_2, R_1' and R_2' represent the residual chemical groups of the substrate and hapten which do not participate in catalytic events, and R_1 and R_1', and R_2 and R_2' are, respectively, substantially similar to each other;
(3) stimulating an immune response to said hapten and
(4) isolating antibodies resulting from said immune response which antibodies are catalytically active for said chemical reaction.

4,963,356

STABLE ANTIGENIC EXTRACTS METHODS

Emanuel Calenoff, Burlingame; Myron A. Beigler, Los Altos Hills; Gerald L. Friesen, Vacaville, and James L. Nichols, Los Altos, all of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 433,962, Oct. 13, 1982, abandoned. This application Apr. 20, 1987, Ser. No. 40,216

Int. Cl.[5] A61K *39/05, 39/36, 39/02*

U.S. Cl. 424—91 25 Claims

1. A process for increasing shelf life stability of an allergenic extract comprising

(a) passing a solution of an unprecipitated allergenic extract through 100,000 and 1,000 dalton ultrafilters and retaining substantially all of the fraction having a molecular weight of from 1,000 to 100,000, and

(b) substantially drying the retained fraction to yield an allergenic product which has an extended shelf life when dry and when reconstituted in an aqueous medium.

4,963,357

TISSUE PLASMINOGEN ACTIVATOR MODIFIED BY THE SUBSTITUTION OF ARG FOR CYS AT POSITION 73, METHODS AND PHARMACEUTICAL COMPOSITIONS THEREFOR

Leslie D. Bell, Chesterfield; Ernest J. Mayer, St. Louis; Mark O. Palmier, Webster Groves; H. Eser Tolunay, Creve Coeur; Thomas G. Warren, Ballwin, and Tze-Chein Wun, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 107,708, Oct. 9, 1987. This application Jan. 29, 1988, Ser. No. 149,793

Int. Cl.[5] C12N *9/48, 15/58, 21/02;* A61K *37/547*

U.S. Cl. 424—94.64 12 Claims

1. A modified human tissue plasminogen activator having an improved in vivo half-life, the modification consisting of the substitution of arginine for cysteine at the position corresponding to position 73 in the 527 amino acid sequence of native human t-PA.

12. A pharmaceutical composition comprising the modified human tissue plasminogen activator of claim 1 and a pharmaceutically acceptable diluent or carrier.

4,963,358

AGENT FOR INHIBITING PROLIFERATION OF HUMAN MALIGNANT TUMOR CELLS

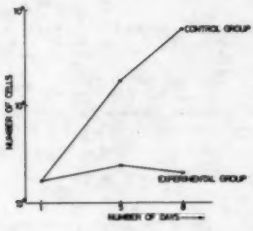
Tomoyuki Tajima, Ichikawa, Japan, assignor to Koken Ltd.; Tadakatsu Oishi; Youichiro Nagasu and Hisao Yamaguchi, all of, Japan

Continuation of Ser. No. 785,229, Oct. 7, 1985, Pat. No. 4,810,495, which is a continuation-in-part of Ser. No. 471,854, Mar. 3, 1983, abandoned. This application Dec. 9, 1988, Ser. No. 282,458

Claims priority, application Japan, Aug. 20, 1982, 57-143340

Int. Cl.[5] A61K *35/12;* C12P *1/00*

U.S. Cl. 424—548 12 Claims



1. An agent for inhibiting the proliferation of human malignant tumor cells, said agent being produced by culturing said human malignant tumor cells at 37° C. for 3 or 4 days in a growth medium comprising a synthetic medium supplemented with new born calf serum, permitting said malignant tumor cells to proliferate in said growth medium until the growth medium is saturated with the malignant tumor cells, washing the medium to remove the serum, incubating in an extraction medium which does not contain calf serum, and thereafter removing said malignant tumor cells, removing of said malignant tumor cells being conducted by passing said tumor cells through a molecular sieve capable of filtering a substance having a molecular weight of not less than 500, and recovering the agent which inhibits proliferation of human tumor malignant cells.

2. The agent of claim 1, wherein

the human malignant tumor cells are selected from the group consisting of established cell lines originating from a human renal carcinoma, a human gastric carcinoma, a human lung carcinoma, a carcinoma from a human oral cavity and a human myogenic sarcoma.

4,963,359

NON-CARIOGENIC CONFECTIONS

Joseph Haslwanter, Germantown, and Walter G. Chambliss, Cordova, both of Tenn., assignors to Plough, Inc., Memphis, Tenn.

Filed Jan. 30, 1989, Ser. No. 303,794

Int. Cl.[5] A61K *9/20*

U.S. Cl. 424—440 6 Claims

1. A medicated non-cariogenic confectionery composition free of cellulosics and graining compounds, said composition comprising:

(a) a viscous liquid matrix in an amount from about 50% to about 99% by weight of said confectionery composition, said viscous liquid matrix comprising:

(1) hydrogenated starch hydrolysates in an amount of about 50% to about 95% of said viscous liquid matrix;

(2) at least one emulsifier in an amount of about 0.5% to about 5% of said viscous liquid matrix;

(3) at least one edible fat, oil wax, or mixtures thereof in an amount of more than 10% to about 50% by weight of said viscous liquid matrix and more than 10% to about 25% by weight of said composition;

in homogeneous admixture with

(b) a semi-solid matrix in an amount from about 50% to about 1% by weight of said confectionery composition, said semi-solid matrix comprising:

(1) hydrogenated starch hydrolysates in an amount of about 0% to about 75% by weight of said semi-solid matrix;

(2) at least one humectant in an amount of about 10% to about 40% by weight of said semi-solid matrix;

(3) at least one viscosity-enhancer in an amount of about 0.5% to about 10% by weight of said semi-solid matrix;

(4) at least one medicament in an amount of from about 0.0001% to about 50% by weight of said semi-solid matrix; and

(5) water in an amount of from about 0.5% to about 8% by weight of said confectionery composition.

4,963,360

EXOTHERMIC PACKAGE BODY HAVING A LAYER CONTAINING A MEDICINAL COMPONENT

Albert Argaud, 17 Bis, Rue Mansart, 78000 Versailles, France

Filed Oct. 26, 1988, Ser. No. 262,879

Claims priority, application Japan, Feb. 12, 1988, 63-17062[U]

Int. Cl.[5] A61F *2/00*

U.S. Cl. 424—443 4 Claims

1. An exothermic medical package body comprising:

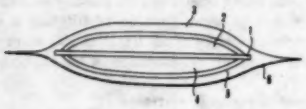
a base sheet;

a carrier layer provided on an obverse surface of said base sheet, said carrier layer comprising 4.0–5.0 g of water, 1–2 g of gelatin, 2–4 g of kaoline, 0.1–0.3 g of antiseptic,

0.2–0.4 g of aluminum chloride, 0.1–0.3 g of propylene glycol, and a medicinal component;

an exothermic layer, provided on a reverse surface of said base sheet, which develops heat when brought into contact with air;

a separable cover for covering said carrier layer;



an air-permeable film covering said exothermic layer, said film to be brought into contact with human skin to transmit heat of said exothermic layer to the skin; and

an air-impermeable packing sheet for sealing and packing said exothermic layer covered by said film.

4,963,361

ETOFENAMATE-CONTAINING ADHESIVE TAPE

Toshikuni Kawazi, Kagawa, Japan, assignor to Teikoku Seiyaku Kabushiki Kaisha, Kagawa, Japan

Filed Apr. 4, 1988, Ser. No. 177,043

Claims priority, application Japan, Apr. 2, 1987, 62-82057

Int. Cl.[5] A61F *13/00*

U.S. Cl. 424—443 **7 Claims**

1. An etofenamate-containing adhesive tape, which comprises a support member and an adhesive mass containing, as essential components thereof, about 1–20 wt.% of etofenamate, about 20–40 wt.% of a styrene-isoprene-styrene block copolymer, about 40–60 wt.% of a tackifier resin, about 0.1–20 wt.% of a liquid paraffin, about 5–20 wt.% of liquid polybutene rubber or liquid polyisoprene rubber and about 0.01–5 wt% of an antioxidant, and wherein said styrene-isoprene-styrene block copolymer has a styrene/rubber ratio of about 14/86, a hardness of about 38, and a 300% modulus of about 7 kg.

4,963,362

FREEZE-DRIED LIPOSOME MIXTURE CONTAINING CYCLOSPORIN

Yueh-Erh Rahman, and Suresh Venkataram, both of Minneapolis, Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 83,773, Aug. 7, 1987, abandoned. This application Jul. 7, 1988, Ser. No. 217,089

Int. Cl.[5] A61K *9/127, 37/22, 45/05*

U.S. Cl. 424—450 **1 Claim**

1. A freeze-dried liposome mixture comprising an amphipathic lipid and a cyclosporin, said mixture being essentially free of saccharide and being storable for at least 120 days and wherein at least 90% of said cyclosporin in said mixture is encapsulated in liposomes of substantially uniform particle size distribution when an aqueous liposome preparation is prepared subsequent to said storage.

4,963,363

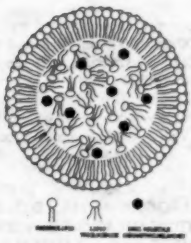
PHOSPHOLIPID DELIVERY VEHICLE FOR AQUEOUS-INSOLUBLE ACTIVE INGREDIENTS

Eric A. Forssen, La Canada, Calif., assignor to Vestar, Inc., Pasadena, Calif.

Continuation of Ser. No. 7,338, Jan. 27, 1987, abandoned. This application May 1, 1989, Ser. No. 346,265

Int. Cl.[5] A61K *9/133, 45/05*; B01J *13/02*

U.S. Cl. 424—450 **18 Claims**



10. A composition suitable for the delivery of a hexamethylmelamine active ingredient comprising monolayer vesicles of about 30 to about 200 nanometers in a pharmaceutically acceptable carrier, the vesicles comprising hexamethylmelamine in mixture with a triglyceride selected from the group consisting of trimyristoylglycerol and trilauroylglycerol, and an encapsulating layer consisting of a monolayer which comprises a phospholipid material.

4,963,364

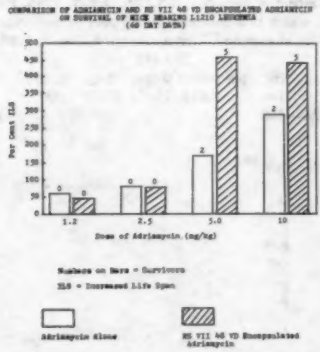
MICROENCAPSULATED ANTITUMOR AGENT

Sidney W. Fox, 12500 SW. 152 St., Bldg. B, Rm 115, Miami, Fla. 33177, and Robert W. Veltri, 7658 Standish Pl., Suite 107, Rockville, Md. 20855

Filed Apr. 10, 1989, Ser. No. 335,952

Int. Cl.[5] A61K *9/66*

U.S. Cl. 424—455 **1 Claim**



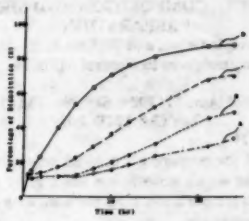
1. A microencapsulated drug delivery vehicle comprising the drug adriamycin enclosed within a thermal copolyamino acid microsphere wherein the said copolyamino acid was polymerized from a mixture of aspartic acid, glutamic acid, and histidine in a ratio of 1:2:4.

4,963,365

CONTROLLED RELEASE DOSAGE FORM

Masayoshi Samejima, Mino; Kazuo Noda, Takarazuka; Masao Kobayashi, Kyoto, and Shigeyuki Ishikawa, Mino, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Nov. 4, 1988, Ser. No. 267,085
Claims priority, application Japan, Nov. 6, 1987, 62-281189
Int. Cl.[5] A61K 9/62
U.S. Cl. 424—46 L 7 Claims



1. A controlled release pharmaceutical dosage from which consists essentially of a water-soluble core containing diltiazem hydrochloride; an inner coating layer composed of ethylcellulose and a hydrophobic substance selected from the group consisting of talc and an alkali earth metal stearate, the quantitative ratio of ethylcellulose to said hydrophobic substance being in the range of about 1:1 to about 1:15 by weight; and an outer coating layer containing diltiazem hydrochloride.

4,963,366

MOLD AND DUST INHIBITING METHOD AND PRODUCT

Richard D. Thomas, 812 N. Euclid St., Fullerton, Calif. 92632

Continuation-in-part of Ser. No. 606,150, May 2, 1984, Pat. No. 4,806,353, and Ser. No. 166,077, Feb. 26, 1988, Pat. No. 4,847,067, said Ser. No. 606,150, is a continuation-in-part of Ser. No. 536,262, Sep. 27, 1983, abandoned, said Ser. No. 166,077, is a division of Ser. No. 27,878, Mar. 19, 1987, Pat. No. 4,770,878.
This application Jan. 23, 1989, Ser. No. 299,442
Int. Cl.[5] A01N 59/26
U.S. Cl. 424—601 80 Claims

1. A method of inhibiting non-uniform accumulations of moisture adjacent wall means of a storage container containing grain, animal feed, animal feed ingredient or hay when said container is subject to large external temperature variations, said method comprising the step of applying to said grain, animal feed, animal feed ingredient or hay prior to introducing said grain, animal feed, animal feed ingredient or hay into said container a propionate free liquid composition comprising an effective moisture migration inhibiting amount of at least one deliquescent substance.

4,963,367

DRUG DELIVERY COMPOSITIONS AND METHODS

Bernard Ecanow, Wilmette, Ill., assignor to Medaphore, Inc., Wilmette, Ill.

Continuation-in-part of Ser. No. 711,066, Mar. 12, 1985, abandoned, and Ser. No. 710,048, Mar. 11, 1985, abandoned, and Ser. No. 835,550, Mar. 3, 1986, Pat. No. 4,849,405, and Ser. No. 896,844, Aug. 14, 1986, abandoned, and Ser. No. 1,314, Jan. 8, 1987, Pat. No. 4,794,000, and Ser. No. 31,237, Mar. 26, 1987, Pat. No. 4,914,084, and Ser. No. 54,193, May 26, 1987, abandoned, and Ser. No. 54,194, May 26, 1987, abandoned, and Ser. No. 811,675, Dec. 20, 1985, Pat. No. 4,738,952, which is a continuation-in-part of Ser. No. 604,476, Apr. 27, 1984, abandoned, said Ser. No. 835,550, is a continuation-in-part of Ser. No. 604,483, May 9, 1984, abandoned. This application Dec. 15, 1987, Ser. No. 130,550
Int. Cl.[5] A61K 9/22, 9/64, 9/66; B01J 13/02
U.S. Cl. 424—485 45 Claims

1. A method of preparing a composition useful as a system to introduce and transport medically useful compositions in the body of mammals;

said composition comprising particles of a coacervate-based matrix having one or more physiologically-active compound incorporated therein and a coacervative-based encapsulating film surrounding each particle;

said method comprising forming a mixture of one or more surface active agents, water and one or more physiologically-active compounds to produce a two phase aqueous coacervate composition containing said compound, and emulsifying the composition to produce an aqueous emulsion of coacervate-based matrix particles containing the physiologically-active compound, said coacervate-based matrix comprising water selected from the group consisting of coacervate phase water, equilibrium phase water, and mixtures thereof, and said physiologically-active compound solubilized therein, said particles having an encapsulating coacervate-based film surrounding the particles.

27. A method of introduction a drug into the circulatory system of a mammal comprising having the mammal orally ingest a composition comprising an aqueous emulsion of coacervate-based matrix particles containing water, a surface active agent, and a drug solubilized therein; said coacervate system including a coacervate-based matrix containing the drug in aqueous solution; and a coacervate-based film encapsulating the matrix particles, said aqueous coacervate-based matrix particles comprising water selected from the group consisting of coacervate phase water, equilibrium phase water, and mixtures thereof and the drug.

4,963,368

OXIDOREDUCTASE ENZYME STABILIZED HIGHLY UNSATURATED FATTY ACIDS AND DERIVATIVES OF SUCH ACIDS

Richard L. Antrim; Norman E. Lloyd, and James B. Taylor, all of Sparta, N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Filed Apr. 18, 1988, Ser. No. 182,629
Int. Cl.[5] A61K 9/50, 37/50
U.S. Cl. 424—498 23 Claims

1. A stabilized fish oil composition comprising microspheres of a hydrophilic colloid as the wall forming member encapsulating at least one unsaturated compound selected from the group consisting of fatty acids and food grade derivatives thereof having at least three to six unsaturated carbon to carbon double bonds, said wall member containing at least one water activated oxidoreductase enzyme and a substrate donor therefore in amounts effective to stabilize said unsaturated compound.

4,963,369

GUM COMPOSITION CONTAINING DISPERSED POROUS BEADS CONTAINING ACTIVE CHEWING GUM INGREDIENTS AND METHOD

Joo H. Song, Skokie; Michael J. Greenberg, Northbrook; David W. Record, River Forest; Steven E. Zibell, Blue Island; Kevin Broderick, Berwyn, and Philip G. Schnell, Downers Grove, all of Ill., assignors to Wm. Wrigley Jr. Co., Chicago, Ill.

Filed Jan. 19, 1989, Ser. No. 299,781
Int. Cl.[5] A23G 3/30
U.S. Cl. 426—5 23 Claims

1. A chewing gum, comprising:

a chewing gum base having dispersed therein water-insoluble porous polymeric beads having microporous passages impregnated with a flavoring agent.

4,963,370

PROCESS FOR PRODUCING PROTEINOUS MATERIAL

Yasuzo Uchida, 2-4 4-chome, Kanamachi, Katsushika-ku, Tokyo, 125, Japan; Hitoshi Nagasaki; Goro Yamamoto, and Keiji Koyama, all of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha and Yasuzo Uchida, both of Tokyo, Japan

PCT No. PCT/JP88/00222, § 371 Date Apr. 28, 1989, § 102(e) Date Apr. 28, 1989, PCT Pub. No. WO89/02705, PCT Pub. Date Apr. 6, 1989

PCT Filed Feb. 29, 1988, Ser. No. 350,745

Claims priority, application Japan, Oct. 1, 1987, 62-248989; Oct. 1, 1987, 62-248990

Int. Cl.[5] A22C *25/00, 29/00;* A23J *1/04;* A23L *1/325*

U.S. Cl. 426—7 6 Claims

1. A process for producing a proteinous material which comprises coarsely grinding fish bodies including bones and/or shells, from which the internals had been removed optionally together with heads and/or skins, and either (1) fermenting said coarsely ground fish bodies with an enzyme and/or a microorganism, inactivating said enzyme and/or microorganism and then finely grinding the fermented material to give a particle size of bones and/or shells of 100μ or less; or (2) finely grinding said coarsely ground fish bodies to give a particle size of bones and/or shells of 100μ or less, fermenting the same with an enzyme and/or a microorganism, and then inactivating said enzyme and/or microorganism; or (3) finely grinding said coarsely ground fish bodies to give a particle size of bones and/or shells of 100 μ or less while fermenting the same with an enzyme and/or a microorganism and then inactivating said enzyme and/or microorganism.

4,963,371

METHOD FOR MAKING A SOLID ANIMAL FEED SUPPLEMENT

Alex E. Miller, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 634,168, Jul. 25, 1984, abandoned. This application Sep. 10, 1987, Ser. No. 96,281

Int. Cl.[5] A23K *1/02, 1/22*

U.S. Cl. 426—69 126 Claims

1. A method for providing a solid, molasses-based animal feed supplement comprising:

(1) mixing under conditions of agitation a first molasses solution, essentially free of added calcium, comprising cane molasses and an orthophosphate compound with a second molasses solution, essentially free of added phosphorus, comprising cane molasses and calcium present substantially in the form of dissolved calcium ions, said first and second solutions containing phosphorus and calcium in sufficient concentrations so that, during said mixing, a reactant solution is produced having a phosphorus concentration of 1 to 2 percent by weight and a calcium concentration of 1 to 2 percent by weight, said reactant solution having a pH between about 4.0 and about 4.5, and substantially all of the calcium present in the reactant solution is in the form of dissolved calcium ions, and

(2) allowing said reactant solution to harden into a solid, molasses-based animal feed supplement containing calcium and phosphorus each in a concentration of 1 to 2 percent by weight.

4,963,372

CONSUMER FRIENDLY CHOCOLATE

Albert Zambé, Neuchatel, Switzerland, assignor to Jacobs Suchard AG, Zarich, Switzerland

Filed Jan. 19, 1989, Ser. No. 298,997

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1988, 3800323

Int. Cl.[5] A23G *3/00;* A23L *1/302, 1/304, 1/305*

U.S. Cl. 426—72 38 Claims

1. A hypo-allergenic chocolate of nutritional value at least equal to white chocolate which consists esentially of: cocoa-butter, sucrose, lecithin, milk fat, and either

(a) protein hydrolysate and an amino acid supplement free from glutamic acid, aspartic acid, arginine and cysteine, or

(b) an amino acid mixture free from glutamic acid, aspartic acid, arginine and cysteine.

4,963,373

R-T-E CEREAL COMPOSITION AND METHOD OF PREPARATION

Steve T. Fan, Maple Grove, and William E. Koski, Minneapolis, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Apr. 17, 1989, Ser. No. 338,811

Int. Cl.[5] A21D *2/00*

U.S. Cl. 426—74 49 Claims

1. A method for preparing a cooked cereal composition of low salt content which nonetheless has a good cooked cereal flavor in a high temperature, high pressure long cook process, comprising the steps of:

A. admixing to form an homogeneous blend of

1. about 60% to 75% by weight of the blend of a farinaceous material having having a starchy component,
2. about 6% to 12% by weight of the blend of sucrose,
3. about 1.0% to 1.5% by weight of the blend of sodium chloride,
4. sufficient amounts of a water soluble calcium salt to provide calcium ion concentration ranging from about 0.05% to 0.2% of the blend said calcium salt having a water solubility of at least 3% by weight, and
5. about 18% to 25% by weight of the blend of water, said blend having a pH ranging from about 6 to 7 and an initial fructose concentration;

B. cooking the blend at conditions of elevated tempera ture by using superheated steam at a pressure of 15 to 30 psig for a period of about 0.5 to 1.5 hours while hydrolyzing sucrose to form a cooked cereal dough having a fructose concentration of about 1% to 2% greater than the initial fructose concentration;

C. forming the cooked cereal dough into pieces of desired shape and size; and

D. drying the pieces to form a ready-to-eat cereal.

4,963,374

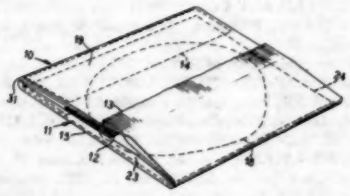
MICROWAVE POPCORN BAG WITH UNPOPPED KERNELS SEPARATOR SCREEN

Charles W. Brandel, Arlington Heights; San Kim, Chicago; Charles S. Wiecek, Glen Ellyn, and Richard F. Heinze, Northbrook, all of Ill., assignors to Food Materials Corporation, Chicago, Ill.

Filed Apr. 3, 1989, Ser. No. 331,869

Int. Cl.[5] A23L *1/25, 1/18*

U.S. Cl. 426—107 18 Claims



1. A microwave package structure enclosing unpopped popcorn for microwave popping of popcorn, comprising:

a normally collapsed internal pressure expansible bag having a generally tubular body with a completely closed bottom end and an opposite dispensing end which is normally

closed when the package has been loaded with unpopped popcorn;

a separator screen dividing said tubular body intermediate said ends into a first major length portion defining a combined unpopped popcorn space and popped popcorn chamber adjacent to said dispensing end, and into a minor length portion adjacent to said bottom end defining a pocket for receiving unpopped popcorn kernels;

screen means on said separator screen large enough for selectively passing unpopped popcorn kernels from said chamber into said pocket but small enough for retaining popped kernels within said chamber; and

rim means on said separator screen for impeding projection of unpopped kernels from the chamber into the pocket during popping and for blocking return of the unpopped kernels from the pocket to the chamber during pouring of popcorn from the opened dispensing end.

4,963,375

METHOD OF CONTROLLING THE BAKING OF FOODS

Akira Sato; Toshio Sato, and Kiyoshi Yamanoi, all of Kawasaki, Japan, assignors to Meiji Seika Kaisha Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 344,726
Claims priority, application Japan, May 2, 1988, 63-107674
Int. Cl.[5] A23L *1/01*
U.S. Cl. 426—233 1 Claim

1. A method of controlling the baking of foods comprising the steps of

measuring an amount of heat to be absorbed by a piece of food material by putting a first object having a relatively high heat-radiation rate (a) and a second object having a relatively low heat-radiation rate (b), in the vicinity of the piece of food material in the food baking apparatus;

measuring amounts (Q_1) and (Q_2) of heat absorbed by the first object and second to calculate conduction heat (C) and radiation heat (R) from equations of

$$Q_1 = C + aR \text{ (kcal/m}^2\text{.hr) and}$$

$$Q_2 = C + bR \text{ (kcal/m}^2\text{.hr);}$$

estimating an amount of (Q) of heat absorbed by the piece of food from the equation of

$$Q = C + \phi R \text{ (kcal/m}^2\text{.hr)}$$

wherein C and R are above calculated values and ϕ is heat radiation rate of the food material; and

controlling at least one of environmental temperature and air flow rate in the baking apparatus, based on the estimated amount of heat (Q).

4,963,376

FOOD COATING COMPOSITIONS AND METHODS FOR THEIR USE IN MICROWAVE COOKING

Karim Nafisi-Movaghar, Walnut Creek, Calif., assignor to Nabisco Brands, Inc., East Hanover, N.J.

Continuation of Ser. No. 913,107, Sep. 29, 1986, abandoned. This application Dec. 21, 1987, Ser. No. 136,450
Int. Cl.[3] A21D *6/00*
U.S. Cl. 426—243 36 Claims

24. A method for imparting brown color and crisp texture to the surface of a microwave-cookable food product comprising:

(a) contacting the surface of the food product with an effective amount of a food coating composition which has not been pre-cooked comprising an edible substantially water-immiscible liquid having therein an amount of a coagulant effective to retard spattering of the composition during microwave cooking and a crisping agent, which does not substantially absorb the water-immiscible liquid, in an amount effective to impart organoleptically perceptible crispness to the surfaces of foods which have been coated with said composition and cooked with microwave radiation, wherein the water immiscible liquid is present in an amount which is effective to completely surround the crisping agent when the food-coating composition is coated onto the surface of foods; and

(b) subjecting said food product to microwave radiation.

4,963,377

DEVICE FOR REMOVING PORTION OF A ROLL AND METHOD OF USING SAME

Paul Rimmeir, The Claridge, 201 S. 18th St., Apt. 2219, Philadelphia, Pa. 19103

Division of Ser. No. 487,438, Apr. 23, 1983, Pat. No. 4,587,866. This application Dec. 3, 1984, Ser. No. 677,437
Int. Cl.[5] A21D *13/00*
U.S. Cl. 426—283 10 Claims

1. A method of forming a sandwich in an unsplit roll comprising inserting an elongated tubular shaft having a longitudinal axis into one end of said roll, advancing the shaft into said roll to a predetermined penetration, rotating said shaft about said axis and thereafter tilting said shaft with respect to said roll to sever a plug of bread of said roll contained within the shaft from the balance of the roll, withdrawing the shaft and the plug of bread contained therein from the roll to produce a hollow roll having a single opening at the end thereof, and filling the roll through said opening with sandwich filling material.

4,963,378

METHOD OF COOKING INVOLVING HIGH PROTEIN FRYING BATTER THAT ELIMINATES THE NEED FOR BREADING AND PRODUCES CRISPY AND CHEWY CRUST

Satish C. Bhardwaj, 1365 W. 7th St., #6H, Brooklyn, N.Y. 11204

Continuation-in-part of Ser. No. 229,296, Aug. 8, 1988, abandoned. This application Sep. 22, 1989, Ser. No. 410,840
Int. Cl.[5] H23L *1/01*
U.S. Cl. 426—302 9 Claims

1. A method of cooking food pieces comprising dipping the food pieces in a batter created by grinding the washed Moong Dal to a desired texture varying from fine granulated texture in which the particles are larger than 100 Microns to a coarse granulated texture in which the particles are smaller than 1400 Microns, dispersing the said ground washed Moong Dal in sufficient aqueous liquids to create a batter consistency varying from thin consistency to thick consistency and deep frying the said dipped food pieces in hot oil until the crust is golden brown, to produce a fried batter coated food piece of superior quality having a crispy and chewy crust.

4,963,379

CHOCOLATE AND WAFER BAR

Pietro Ferrero, Bruxelles, Belgium, assignor to Ferrero S.p.A., Italy

Filed Jun. 12, 1989, Ser. No. 364,706
Claims priority, application Italy, Jun. 16, 1988, 53226/88[U]
Int. Cl.[5] A23G *3/00*
U.S. Cl. 426—306 11 Claims

4. A process for preparing a chocolate bar, comprising:

a. a step of providing a first wafer sheet having an interconnecting web and a plurality of hollow projections extending from the wafer sheet web and defining cavities;

b. providing within said cavities a creamy anhydrous filling;
c. coupling a chocolate base to the wafer sheet on the side facing said cavities; and
d. providing on the side of said wafer sheet opposite to the chocolate base a chocolate coating layer.

4,963,380

BEVERAGES CONTAINING FISH OILS STABILIZED WITH FRUCTOSE

Lisa R. Schroeder, Brooklyn Park, and Dorothy J. Muffett, Bloomington, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 126,327, Nov. 30, 1987, abandoned. This application Feb. 22, 1989, Ser. No. 314,186
The portion of the term of this patent subsequent to Apr. 3, 2007, has been disclaimed.
Int. Cl.[5] H23D 5/00
U.S. Cl. 426—330.3 12 Claims

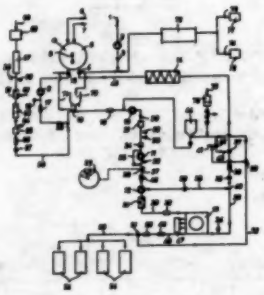
1. A nutritional beverage containing fish oil yet exhibiting enhanced stability against flavor degradation without heat treating, comprising:
A. about 10% to 92% by weight of a moisture containing flavor ingredient having a water component and a flavor component;
B. about 1% to 40% by weight of a deodorized nonhydrogenated fish oil, said fish oil having
(1) about 150 to 200 ppm of a fish oil stabilizing oil soluble antioxidant selected from the group consisting of TBHQ, BHA, BHT and mixtures thereof;
C. about 0.5% to 30% by weight of fructose;
D. sufficient emulsifier to form a stable oil-in-water emulsion; and wherein said beverage is substantially free of fish meat, and wherein the weight ratio of fructose to fish oil is at least 10:100.

4,963,381

METHOD FOR PARTIAL OR TOTAL DEALCOHOLIZATION OF WINE AND/OR CIDER AND DEVICE FOR IMPLEMENTING SUCH METHOD

Jean-Marc Girard, Payerne, and Philippe Cuenat, Nyon, both of Switzerland, assignors to Federation des Cooperatives Migros, Zurich, Switzerland

PCT No. PCT/CH86/00178, § 371 Date Sep. 28, 1987, § 102(e) Date Sep. 28, 1987, PCT Pub. No. WO87/03902, PCT Pub. Date Jul. 2, 1987
PCT Filed Dec. 18, 1986, Ser. No. 96,014
Claims priority, application France, Dec. 19, 1985, 85 19097
Int. Cl.[5] C12G 3/08
U.S. Cl. 426—490 9 Claims



1. A process to dealcoholize partially or totally an alcoholic liquid, by reverse osmosis, wherein the liquid to be dealcoholized is stored and processed in a dealcoholizing circuit in a non-oxidizing atmosphere; said liquid also containing water and original ingredients is passed through a module of reverse osmosis to obtain a permeate and a retentate, the permeate containing alcohol and water and the retentate containing the remaining original ingredients; the loss of volume due to separation of the permeate from the retentate is continually made up for with an injection into said retentate of demineralized water totally free of any trace of chlorine; natural or artificial ingredients not derived from the original liquid are added to the retentate; and the retentate thus completed is clarified and filtered, then pasteurized.

4,963,382

REDUCED CALORIE D-ALDOHEXOSE MONOSACCHARIDES

Blaise J. Arena, Des Plaines, and Edward C. Arnold, Naperville, both of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jun. 22, 1989, Ser. No. 369,985
Int. Cl.[5] A23L 1/09, 1/307
U.S. Cl. 426—548 24 Claims

1. A reduced-calorie bulking and sweetening agent for edible formulations comprising at least one D-aldohexose selected from the group consisting of D-talose and D-allose.

4,963,383

PROCESS FOR PRODUCING KONJAK JELLY

Hisashi Nozaki, and Seiya Sakurai, both of Saitama, Japan, assignors to Kabushikikaisha Kibun, Tokyo and Kabushikikaisha Kyowashokuhin, Saitama, both of, Japan

PCT No. PCT/JP87/00881, § 371 Date Jul. 13, 1988, § 102(e) Date Jul. 13, 1988, PCT Pub. No. WO88/03760, PCT Pub. Date Jun. 2, 1988
PCT Filed Nov. 13, 1987, Ser. No. 229,174
Claims priority, application Japan, Nov. 19, 1986, 61-274175; Nov. 19, 1986, 61-274176; Nov. 19, 1986, 61-274177
Int. Cl.[5] A23L 1/528
U.S. Cl. 426—573 20 Claims

1. A process for producing a thermally irreversible thickened gel which is blendable with other food products, said process comprising the steps of:
(a) forming a konjak past by mixing components consisting essentially of konjak flour, an amount sufficient of water to cause the konjak flour to swell and dissolve, and a basic amino acid, a basic salt, or mixture thereof;
(b) heating said konjak paste under weak alkaline conditions at a temperature and time sufficient to begin the setting of said konjak paste, said temperature being about 60° C. or more, to thereby begin setting of said konjak paste; and
(c) then, prior to completion of setting of said heated konjak paste, rapidly cooling the heated paste and thus stopping said setting prior to essential completion of said setting of said konjak paste into a firm gel.

4,963,384

PROCESS FOR PRODUCING BIFIDOGENIC INFANT AND DIETETIC FOODS REDUCED IN ANTIGENICITY

Willi Heine, and Klaus-Dieter Wutzke, both of Rostock, German Democratic Rep., assignors to Milupa Aktiengesellschaft, Friedrichsdorf, Fed. Rep. of Germany

Filed Sep. 13, 1988, Ser. No. 243,804
Claims priority, application German Democratic Rep., Sep. 14, 1987, 23306942
Int. Cl.[5] A23C 9/20
U.S. Cl. 426—580 10 Claims

1. A process for producing bifidogenic infant and dietetic foods from a mammalian milk material containing one or both of milk protein and milk protein degradation products and selected from the group consisting of full-cream mammalian milk, skimmed mammalian milk, dietary proteins obtained from mammalian milk, and quarg comprising cleaving sialic acid by non-enzymatic means from said milk protein and/or said milk protein degradation products until a bifidogenic

mammalian milk material is obtained, while retaining said cleaved sialic acid in said mammalian milk material.

4,963,385

STABILIZED EMULSIONS CONTAINING HIGHLY UNSATURATED OILS

Richard L. Antrim, and James B. Taylor, both of Sparta, N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Filed Jan. 2, 1989, Ser. No. 360,631
Int. Cl.[5] A23D 7/00; A23C 15/00
U.S. Cl. 426—602 **12 Claims**

1. An aqueous food emulsion containing fish oil and a stabilizer therefor which comprises as the oil component of said emulsion at least one unsaturated compound selected from the group consisting of fatty acids and non-toxic derivatives thereof having at least three to six unsaturated carbon to carbon double bonds therein and, present in the water phase of said emulsion as a stabilizer adapted to prevent oxidative attack upon said double bonds, an amount of stabilizer effective to stabilize the fish oil against rancidity for at least 83 days, said stabilizer being selected from the group consisting of raffinose, trehalose, and sorbitol and a metal-ion chelator.

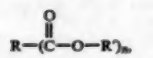
4,963,386

COMPLEX LINKED ESTER LOW CALORIE FAT MIMETICS

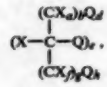
Lawrence P. Klemann, Somerville, and John W. Finley, Whippany, both of N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Continuation-in-part of Ser. No. 365,745, Jun. 13, 1989, abandoned, which is a continuation of Ser. No. 144,962, Jan. 19, 1988, abandoned. This application Sep. 25, 1989, Ser. No. 411,913
Int. Cl.[5] A23D 7/00, 9/00, 3/00
U.S. Cl. 426—611 **38 Claims**

1. A process for producing a food product containing a fat mimetic compound of the following formula:



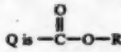
wherein the R is a linking covalent bond or aliphatic group, n is 2 to 6, and the R′ groups comprise residues defined by the formula:

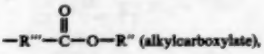


wherein

C is a carbon atom;

X is a bridging bonding valence, hydrogen, or a substituted or unsubstituted lower aliphatic group, the various X groups being the same or different;


Q is —C—O—R″ (carboxylate),


—R‴—C—O—R″ (alkylcarboxylate),

—O—C—R″ (carboxy), —R‴—O—C—R″ (alkylcarboxy),

—O—R″ (alkoxy), or —R‴—O—R″ (alkylalkoxy) radical, wherein at least one of the Q radicals is other than carboxy;

R″ is a substituted or unsubstituted aliphatic group, containing 1 to 30 carbons,

the various R′ and R″ groups,

respectively, being the same or different;

R‴ is a lower alkylene;

and, wherein:

a=0 to 3;

b=0 to 4;

d=1 or 2;

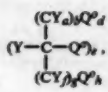
e=0 to 5;

f=0 to 3;

g=0 to 4; and

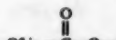
h=1 or 2,

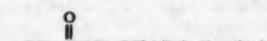
from a base reactant compound of the following formula:

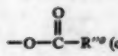


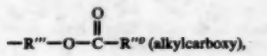
wherein

Y is a hydroxyl, hydrogen, or substituted or unsubstituted lower aliphatic group, the various Y groups being the same or different and


Q° is —C—O—R‴° (carboxylate),


—R‴—C—O—R‴° (alkylcarboxylate),


—O—C—R‴° (carboxy),


—R‴—O—C—R‴° (alkylcarboxy),

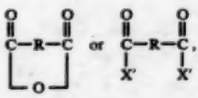
—O—R‴° (alkoxy), or —R‴—O—R‴° (alkylalkoxy) radical, wherein at least one of the Q° radicals is other than carboxy;

R‴° is a substituted or unsubstituted aliphatic group, containing 1 to 30 carbons,

the various R′ and R″ groups, respectively, being the same or different

said process comprising:

reacting said base reactant compound with a substituent reactant compound of either of the following formulae:



wherein X′ is a halogen element or a hydroxyl group, under conditions at which said fat mimetic compound will be formed;

purifying said product compound; and

incorporating said product compound in a food product.

4,963,387

SALT SUBSTITUTE AND FOODSTUFFS CONTAINING SAME

Takahiro Nakagawa, Osaka, and Shiro Tanaka, Tokyo, both of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo and San-Ei Chemical Industries, Ltd., Osaka, both of, Japan

Filed May 19, 1988, Ser. No. 195,982

Claims priority, application Japan, May 20, 1987, 62-124970; Jul. 7, 1987, 62-170088; Jul. 22, 1987, 62-184201; Jul. 22, 1987, 62-184202; Jan. 27, 1988, 63-16700; Jan. 27, 1988, 63-16701

Int. Cl.[5] C01D *13/00*; A23C *21/00*

U.S. Cl. 426—649 21 Claims

1. A slat substitute consisting essentially of an alkali metal salt with an amount of whey mineral effective to enhance the saltiness of said alkali metal salt.

4,963,388

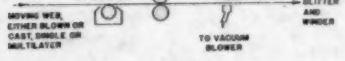
METHOD FOR FORMING PARTICLE-IMPREGNATED ONE-SIDED CLING STRETCH WRAP FILM

Gordon L. Benoit, Macedon, N.Y., assignor to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 39,891, Apr. 17, 1987, Pat. No. 4,833,017. This application Feb. 21, 1989, Ser. No. 313,402

Int. Cl.[5] B05D *5/08, 1/06, 7/04*; B29C *59/04*

U.S. Cl. 427—29 3 Claims


POWDER APPLICATOR
POWDER IMPREGNATING NIP
EXCESS POWDER REMOVAL
TO SLITTER AND WINDER
MOVING WEB, EITHER BLOWN OR CAST, SINGLE OR MULTILAYER
TO VACUUM BLOWER

1. A method for forming a one-sided cling stretch wrap film which comprises

(a) providing a stretch wrap film structure in which one exposed surface exhibits a significant cling property;

(b) adhering a particulate antiblock to the other exposed surface while the surface is in a semi-plastic state;

(c) applying a particle-embedding force against said other exposed surface having particulate antiblock adhered thereto; and

(d) removing excess particulate antiblock which has not been adhered and embedded into said other exposed surface, thereby forming a one-sided cling stretch wrap film possessing a cling property on one surface, and a slide property on the other surface of the film.

4,963,389

METHOD FOR PRODUCING HYBRID INTEGRATED CIRCUIT SUBSTRATE

Mitsuyuki Takada; Ryusaku Tsukao, and Hayato Takasago, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 825,996, Feb. 4, 1986, abandoned. This application Jan. 6, 1989, Ser. No. 294,990

Claims priority, application Japan, Feb. 22, 1985, 60-34789

Int. Cl.[5] C23C *26/00*

U.S. Cl. 427—98 5 Claims

1. A method for producing a hybrid integrated circuit substrate, consisting essentially of the sequential steps of:

(i) forming a resistor on an electrically insulating substrate;

(ii) forming an insulating, activating layer for depositing a chemical plating on said electrically insulating substrate in contact with said resistor;

(iii) coating a resin precursor on an overall surface of said substrate as modified by steps (i) and (ii), said surface being that on which said resistor is formed;

(iv) removing a portion of said resin layer by photolithography to form an exposed portion of said activating layer; and

(v) forming an electrically conductive layer by chemical plating on the exposed portion of said activating layer.

4,963,390

METALLO-ORGANIC SOLUTION DEPOSITION (MOSD) OF TRANSPARENT, CRYSTALLINE FERROELECTRIC FILMS

Russell A. Lipeles, Los Angeles, and Dianne J. Coleman, Long Beach, both of Calif., assignors to The Aerospace Corporation, El Segundo, Calif.

Filed Oct. 5, 1988, Ser. No. 253,538

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—110 7 Claims

1. An improved coating deposition process for transparent, ferroelectric films up to 5mm thick consisting of the following steps:

a. mixing liquid state metallo-organic starting materials consisting of at least one alkoxide or carboxylic acid salt of the metals selected from a group consisting of barium, strontium, lead, lanthanum or lithium or a from a group consisting of zirconium, titanium or niobium to form a coating solution;

b. spinning, dipping, or spraying the coating solution on the substrate to be coated;

c. drying the coated substance at low temperature in the range of 100–200° C. in air or a vacuum, thereby removing low boiling solvent molecules;

d. rapidly densifying the coated substrate at moderate temperature (400–600° C, thereby forming an amorphous film;

e. repeatingthe above steps until a desired coating thickness is obtained; and

f. annealing the thus formed film at a temperature in the range 525–800° C. to obtain a transparent ferroelectric oxide film with a controlled grain size.

4,963,391

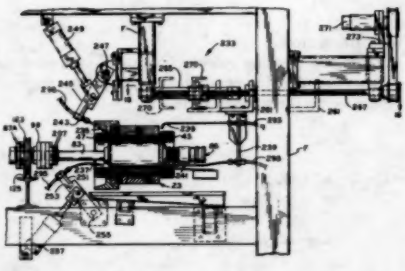
METHOD OF OPERATING APPARATUS

Eugene C. Bair, Holland, Mich., and Frederick C. Burke, Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Filed Jun. 10, 1989, Ser. No. 743,382

Int. Cl.[5] H02K *15/12*

U.S. Cl. 427—116 25 Claims



1. A method of operating apparatus adapted to treat with a hardenable liquid adhesive material a plurality of cores each having winding means with a pair of opposite end turn groupings, thereon, the apparatus including endless conveyor means

for carrying a set of rotatable spindles through a plurality of preselected indexed positions in a predetermined course of the endless conveyor means, a plurality of means operable generally for driving the endless conveyor means, a plurality of means for dispensing the hardenable liquid adhesive material and arranged at some of the preselected indexed positions, respectively, a source of the hardenable liquid adhesive material, and a plurality of means for pumping the hardenable liquid adhesive material to the dispensing means, each pumping means including chamber means for receiving the hardenable liquid adhesive material from the source, and means reciprocally movable in the chamber means and operable generally for displacing the hardenable liquid adhesive material from the chamber means, and a plurality of latching means for releasably securing the displacing means with a means operable generally for actuating the displacing means, respectively, the method comprising the steps of:

actuating a part of each driving means into coupling engagement with confronting parts on the endless conveyor means when the spindles are in their preselected indexed positions, respectively;

operating the driving means conjointly and moving the driving means generally in opposite directions to impart discrete intermittent movements to the endless conveyor means through its predetermined course only when the driving means parts are coupled in engagement with the confronting parts on the endless conveyor means, respectively;

disposing the cores on at least some of the spindles when the spindles are in some others of the preselected indexed positions and advancing the spindles successively through the preselected indexed positions in response to the moving step, respectively;

rotating some of the spindles in one direction and some others of the spindles in another direction opposite the one direction at least upon the advancement of the spindles into the some preselected indexed positions and adjusting the rotational speeds of the spindles to maintain the rotational speeds of the spindles generally constant and compensate for alterations in the rotational speeds of the spindles occuring in response to the discrete intermittent movements of the endless conveyor means, respectively;

moving the dispensing means from at-rest positions into predetermined located positions generally adjacent the opposite end turn groupings of the winding means of the cores disposed on the spindles at least upon the successive advancement of the spindles into the some preselected advancement of the spindles into the some preselected indexed positions, respectively;

operating the actuating means and driving at least generally conjointly the displacing means within the chamber means of the pumping means, respectively;

delivering the hardenable liquid adhesive material from the chamber means to the dispensing means in their predetermined located positions in response to the driving step and dispensing the hardenable liquid adhesive material from the dispensing means onto the opposite end turn groupings of the winding means of the cores disposed on the spindles at least when the spindles are being rotated in the some preselected indexed positions, respectively; and

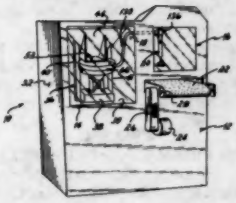
interrupting the releasable securement of one of the latching means with some of the displacing means when one of the spindles without a core disposed thereon is successively advanced into one of the some preselected indexed positions and obviating thereby the delivery of the hardenable liquid adhesive material to the dispensing means at the one of the some preselected indexed positions, respectively.

4,963,392

FIBER SPRAY SYSTEM

Julius J. Molnar, Amherst, and Richard A. Becker, Lorain, both of Ohio, assignors to Nordson Corporation, Westlake, Ohio

Filed Oct. 21, 1988, Ser. No. 261,036
Int. Cl.[5] B05C *5/00*
U.S. Cl. 427—180 **32 Claims**



1. Apparatus for spraying fibers, comprising:

a fiber collector having an interior formed with an inlet and an outlet;

means for feeding fibers into said interior of said fiber collector;

a pump having a suction inlet and a discharge outlet;

a spray device connected to said discharge outlet of said pump;

a delivery hose having an inlet end connected to said outlet of said fiber collector and an outlet end connected to said suction inlet of said pump, said outlet end of said delivery hose being positioned vertically higher than said inlet end thereof, said pump creating a negative pressure within said interior of said fiber collector to entrain fibers therein within a stream of air drawn through said inlet of said fiber collector and to transmit said air-entrained fibers through said delivery hose from said fiber collector to said pump;

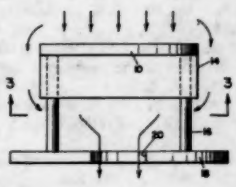
means for introducing a volume of air upstream from said suction inlet of said pump so that said air-entrained fibers accumulate in an area within said delivery hose upstream relative to said pump and said outlet end of said delivery hose, said pump being effective to withdraw said air-entrained fibers from said area within said delivery hose into said suction inlet thereof and to eject said air-entrained fibers through said discharge outlet into said spray device for deposition onto a substrate.

4,963,393

METHOD TO PREVENT BACKSIDE GROWTH ON SUBSTRATES IN A VAPOR DEPOSITION SYSTEM

Jitendra S. Goela, Andover, Mass.; Roy D. Jaworski, Exeter, N.H., and Raymond L. Taylor, Saugus, Mass., assignors to CVD Incorporated, Woburn, Mass.

Filed Sep. 7, 1989, Ser. No. 403,957
Int. Cl.[5] C23C *16/00, 16/04*
U.S. Cl. 427—248.1 **3 Claims**



1. A method for preventing backside growth on a substrate in a vapor deposition reactor comprising the steps of:

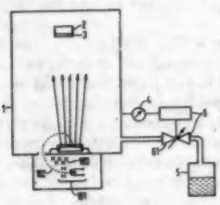
(a) mounting said substrate on pillars in said reactor,
(b) fabricating from flexible graphite a hollow body that is compatible with the substrate and is open at one end but closed at the other end, using graphite cement as a bonding agent,
(c) mounting the hollow body on the pillar in cooperative relation with the substrate with the open end thereof facing the backside of the substrate,
(d) pressing and sealing the open end of the hollow body against the substrate closely adjacent the periphery thereof, and
(e) upon completion of the vapor deposition process, removing the hollow body from the substrate by piercing the hollow body and breaking it up into pieces.

4,963,394

METHOD FOR PRODUCING THIN METAL FILMS BY VAPOR-DEPOSITION

Josef Willer, Oberschleissheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 12, 1989, Ser. No. 336,884
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1988, 3812141
Int. Cl.[5] C23C *16/00*
U.S. Cl. 427—250 **20 Claims**



1. A method for manufacturing thin metal films by thermal vapor-deposition comprising the steps of:
introducing a substrate to be provided with a metal film into a recipient;
determining a range for the value of a mechanical stress that occurs in a resultant vapor-deposited metal film;
setting the partial pressure of an auxiliary gas in the recipient so that during the duration of a vapor-deposition, the value of the mechanical stress occurring in the vapor-deposited metal film lies within a prescribed range; and
vapor-depositing a metal film on the substrate.

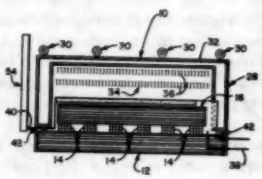
4,963,395

METHOD OF CHROMIZING LARGE SIZE ARTICLES

Everett C. Lewis, McDonald, and Harley A. Grant, Harrison, both of Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 210,906, Jun. 24, 1988, abandoned. This application Jan. 31, 1990, Ser. No. 472,687
Int. Cl.[5] C23C *16/00*
U.S. Cl. 427—253 **7 Claims**

1. A method particularly suited for applying a chromium coating to one or more of the surfaces of large size articles comprising the steps of:
a. providing a stationary foundation and a plurality of supports positioned in spaced relation one to another on the stationary foundation;
b. mounting on the plurality of supports positioned on the stationary foundation a retort having a removable cover and sufficient internal size to accommodate therewithin a layer of large size articles;
c. spreading evenly over the bottom of the retort a one-half inch thick layer of a powder containing as a source of chromium 3% ammonium chloride and 42% ferrochromium, the balance consisting of alumina;
d. positioning on the layer of powder in the retort a layer of large size articles to which a chromium coating is to be applied to one or more surfaces thereof;
e. covering the large size articles positioned in the retort in accordance with step d. with an additional four inch thick layer of the chromium source powder;
f. placing the cover on the retort;
g. sealing the cover in place;
h. positioning in surrounding relation to the retort a furnace embodying electrical heating elements capable of providing a uniform amount of heat over a given area;
i. sealing off the furnace and thereby also the retort from the environment surrounding the furnace;
j. heating the retort and the large size articles emplaced in the retort to a uniform temperature of 2100° F.;
k. supplying concurrent with the commencement of the heating in accordance with step j. an inert gas to the interior of the retort;
l. conveying out of the retort by means of the inert gas flowing through the retort the fumes generated in the



retort as the retort and the large size articles emplaced within the retort are each being uniformly heated;
m. discharging from the retort the inert gas and the fumes;
n. igniting the fumes conveyed out of the retort;
o. supplying concurrent with the commencement of the heating in accordance with step j. an inert gas within the furnace in surrounding relation to the retort;
p. conveying and discharging the fumes generated within the furnace during heating out of the furnace by means of the inert gas flowing within the furnace in surrounding relation to the retort;
q. igniting the fumes discharged from the furnace;
r. continuing heating the retort at 2100° F. for 10 hours;
s. shutting off both the flow of the inert gas to the retort and the flow of inert gas to the furnace upon terminating the heating;
t. cooling the retort and the large size articles emplaced within the retort uniformly throughout to a temperature of 400° F.;
u. removing the furnace from its surrounding relation to the retort upon completion of the cooling in step t.;
v. removing the cover from the retort; and
w. removing the coated large size articles therefrom.

4,963,396

METHOD FOR MAKING AN IMPREGNATED CERAMIC MATERIAL

Kazuo Ito, Yamagata; Shuitsu Matsuo, Atsugi, and Yasumi Sasaki, Nagai, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Japan

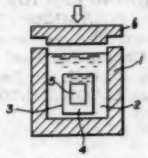
Filed Feb. 13, 1989, Ser. No. 309,631
Int. Cl.[5] B05D *1/10, 3/12*
U.S. Cl. 427—294 **17 Claims**

1. A method for impregnating a shaped, porous ceramic material with an impregnation liquid, said method comprising:
providing a resilient separator having one surface in contact with the impregnation liquid and a pressure transfer liquid in contact with the opposite side of said separator, said

separator thereby separating said impregnating liquid from said pressure transfer liquid;

immersing the ceramic material in the impregnation liquid;

applying an impregnation pressure to said pressure transfer liquid, said pressure being transferred through said resilient separator to said impregnation liquid to force said impregnation liquid into the pores of the shaped porous ceramic material.



2. The method of claim 1, wherein prior to applying the impregnation pressure to the impregnation liquid, a negative pressure is applied to the shaped material so that any gas remaining in the shaped material can be discharged therefrom.

4,963,397

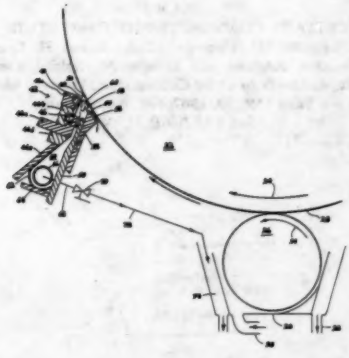
PAPER COATING SYSTEM AND METHOD

Michael A. Mayer, Stevens Point; Lucien L. Mason, Nekoosa; Leonard C. Olson, and Keith H. Riemer, both of Wisconsin Rapids, all of Wis., assignors to Consolidated Papers, Inc., Wisconsin Rapids, Wis.

Continuation of Ser. No. 172,377, Mar. 24, 1988, abandoned. This application Aug. 7, 1989, Ser. No. 390,605

Int. Cl.[5] B05D *3/12*

U.S. Cl. 427—356 **15 Claims**



1. A method of metering and leveling an excess layer of liquid coating material applied onto a web of paper traveling at a high rate of speed, comprising the steps of extending a doctor against and across the surface of the web, at a point downstream and spaced from the point of application of the excess coating layer onto the web, to doctor the coating on and remove excess coating from the surface; establishing an elongate chamber extending across the web upstream from the doctor, the chamber having an upper end adjacent to the web and a lower end; flowing excess coating removed from the web by the doctor into the chamber; forming the excess coating in the chamber into an eddy current pool of coating in the chamber upper end and extending transversely across the web in contact with the excess coating layer on the web substantially immediately upstream from the doctor to rewet, smooth and level nonuniformities in the excess coating layer on the web before it reaches the doctor; and controllably draining coating through an adjustable valve from and uniformly longitudinally along the chamber lower end at a rate to maintain the eddy current pool of coating in the chamber upper end uniformly in contact with the web across the transverse extent thereof, whereby the excess coating layer doctored on the web is very uniform and is doctored very uniformly.

4,963,398

PROCESS FOR CONTINUOUS PRODUCTION OF SURFACE-CONSOLIDATED LUMBER

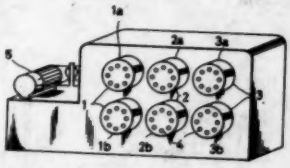
Takeo Deno, Yokohama, Japan, assignor to Sumitomo Forestry Co., Ltd., Osaka, Japan

Filed Jan. 31, 1989, Ser. No. 304,813

Claims priority, application Japan, Apr. 19, 1988, 63-96194

Int. Cl.[5] B05D *3/12*

U.S. Cl. 427—366 **23 Claims**



1. A process for the continuous production of a surface-consolidated lumber, which comprises

coating a lumber with a thermosetting resin, said lumber having an initial thickness,

feeding the coated lumber between a pair of opposed hot-pressing rolls of a plurality of pairs of opposed rolls,

continuously heat-compressing the lumber between the pair of hot-pressing rolls and simultaneously curing the thermosetting resin, thereby consolidating and hardening the surface layer of the lumber,

said heat-compression being carried out under conditions such that the distance between the opposed rolls of each of said pairs of rolls is 80 to 95% of the initial thickness of the lumber and with at least one of the opposed rolls of at least one of said pairs of rolls being heated to a temperature higher than 150° C.

4,963,399

POLYURETHANE FOAM WITH LOW VINYL-STAINING TENDENCIES

William A. Gill, Hurricane, W. Va., assignor to Union Carbide Chemicals and Plastics Company, Inc., Danbury, Conn.

Continuation of Ser. No. 32,771, Mar. 31, 1987, abandoned. This application Mar. 16, 1988, Ser. No. 169,082

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—373 **14 Claims**

1. A process for the production of polyurethane foams which exhibit a reduced tendency to stain vinyl films adhered thereto comprising:

(a) forming a reaction mixture comprising

(i) at least one polyol;

(ii) at least one polyisocanate;

(iii) a catalyst consisting essentially of at least one amine catalyst having an average molecular weight of no greater than about 160, wherein said amine catalyst comprises less than about 1.0 wt. % of the reaction mixture and is selected from the group consisting of triethylamine, bis(2-dimethylaminoethyl)ether, dimethylenthanolamine, N-methyldiethanolamine, 2-(2-dimethylaminoethoxy)ethanol and mixtures thereof; and

(iv) at least one amine crosslinker selected from the group consisting of the reaction products of triethanol-amine, trisisopropanolamine, N-methyl-diethanolamine, N-ethyl-diethanolamine, N, N-dimethyl-ethanolamine and mixtures thereof with alkylene oxides and wherein said

amine catalyst and said amine crosslinker are present in such amounts such that their sum comprises less than about 2.0 wt. % of the reaction mixture; and

(b) contacting said reaction mixture with a vinyl film;

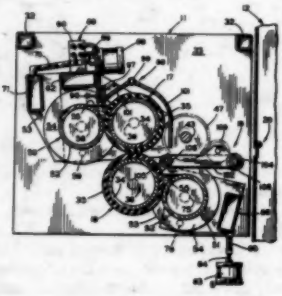
(c) reacting the reaction mixture under suitable conditions to form a polyurethane foam with the vinyl film adhered thereto.

4,963,400

METHOD AND APPARATUS FOR APPLYING A DRY FILM DRAWING LUBRICANT TO SHEET MATERIAL

Russell S. Bibbee, and Robert E. Stearns, both of Fostoria, Ohio, assignors to Precision Carbide Die, Inc., Bloomdale, Ohio

Filed Apr. 28, 1989, Ser. No. 344,824
Int. Cl.[5] B05D 3/02
U.S. Cl. 427—374.1 27 Claims



1. Apparatus for applying a film of a drawing and forming lubricant to a surface of a sheet of material comprising, in combination, a roll box section including at least one applicator roll adapted for rolling engagement with said surface for depositing said film of lubricant in liquid form on said surface, an enclosed heat chamber including therein means for radiantly heating said film to evaporate liquid therefrom without significantly raising the temperature of said sheet, an enclosed cooling chamber including means reducing the temperature of said film to a substantially ambient level, and means conveying said sheet successively through said roll box section, said heat chamber and said cooling chamber, whereby said lubricant film is essentially dry upon emergence of said sheet from said cooling chamber.

4,963,401

METHOD AND COMPOSITION FOR PROTECTING AND ENHANCING THE SOLDERABILITY OF METALLIC SURFACES

Alfred F. Kaspaul, Malibu, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 11, 1989, Ser. No. 336,178
Int. Cl.[5] B05D 3/02
U.S. Cl. 427—388.1 26 Claims

1. A method for protecting and enhancing the solderability of a metallic surface comprising the steps of:

(a) providing a mixture of a dicarboxylic acid fluxing agent and a chosen protective material which is unreactive with said dicarboxylic acid and which forms a film with said dicarboxylic acid that alters at a chosen soldering temperature to release said dicarboxylic acid, wherein said chosen protective material is selected from the group consisting of a cellulose derivative, a vinyl chloride copolymer, an acrylic copolymer, a polyether glycol, and a thermoplastic elastomer; and

(b) forming a film from said mixture on said metallic surface wherein said film provides protection of said metallic surface from contamination during storage prior to a soldering process, and, upon subsequent exposure to said chosen soldering temperature, releases said fluxing agent to thereby enhance the solderability of said metallic surface.

4,963,402

FILMS CONTAINING LIQUID CRYSTALLINE POLYMERS

Chia P. Wong, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 21, 1987, Ser. No. 88,160
Int. Cl.[5] G11B 23/00
U.S. Cl. 428—1 37 Claims

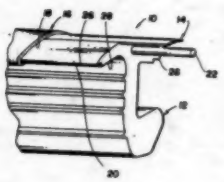
1. A film having a surface which comprises protrusions resulting from regions of a thermotropic liquid crystalline polymer in a host polymer, said film containing from about 0.01 to about 1 weight percent of said thermotropic liquid crystalline polymer.

4,963,403

UNITARY COMPOSITE MOLDING STRIP

Edward Roberts, Mt. Clemens, Mich.; James H. Greatorex, Wellsbourne, England, and Douglas W. Spittal, Caniachie, Canada, assignors to Color Custom, Inc., Warren, Mich.

Filed Oct. 30, 1987, Ser. No. 114,500
Int. Cl.[5] B60R 13/04
U.S. Cl. 428—31 8 Claims



1. A unitary composite molding strip comprising:

a body of extruded plastic having a top surface and a stem extending from the opposite side of the top surface;

a thin, narrow, plastic strip including a decorative layer and overlaying the top surface of the plastic body;

at least a pair of part receiving and retaining grooves on the opposite sides of the stem; and

a top coat of a clear plastic co-extruded with the body of extruded plastic and having a bottom surface overlaying the decorative layer of the plastic strip, the plastic top coat being interbonded with the plastic body by interfusion between the surfaces while in a molten state to form the molding strip with the plastic strip therebetween so that the decorative layer can be seen through the clear plastic top coat and to prevent the plastic body from separating from the top coat during use of the molding strip.

4,963,404

PROCESS FOR THE PRODUCTION OF A COATED PRODUCT, THIN-WALLED COATED CYLINDER OBTAINED BY USING SAID PROCESS, AND AN INK TRANSFER ROLLER COMPRISING SUCH A CYLINDER

Jerome D. Jenkins, Wauwatosa, Wis., assignor to Stork Screens B.V., Netherlands

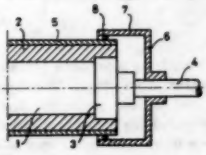
PCT No. PCT/NL87/00009, § 371 Date Mar. 3, 1988, § 102(e) Date Mar. 3, 1988, PCT Pub. No. WO87/06627, PCT Pub. Date Nov. 5, 1987

PCT Filed May 4, 1987, Ser. No. 148,214

Claims priority, application Netherlands, May 1, 1986, 8601119

Int. Cl.[5] B41N 7/00; C23C 28/00

U.S. Cl. 428—34.7 5 Claims



1. An ink transfer roller comprising a thin-walled coated cylinder obtained by a process in which an adhesion layer consisting of metal and a coating comprising a mixture of a ceramic and fluorocarbon polymer are each applied by means of plasma spraying to a cylinder to be coated, said adhesion layer being between the surface of said cylinder to be coated and said coating, said adhesion layer being formed by plasma spraying using at least two metals reacting with each other exothermally under plasma spraying conditions, said coating being provided with a surface pattern of cavities by means of beam treatment, said roller also comprising fastening means for said cylinder enabling said cylinder to be used as an ink transfer roller, said ink transfer roller further having sealing means to prevent deposition of ink between said cylinder and said fastening means.

4,963,405

TAPE FOR ENCASING ELECTRONIC PARTS

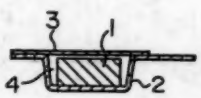
Shunsuke Yamashita, and Norihito Kondoh, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 20, 1989, Ser. No. 383,037

Claims priority, application Japan, Aug. 12, 1988, 63-201494

Int. Cl.[5] B65D 73/02; C09J 7/02

U.S. Cl. 428—40 3 Claims



1. A tape for encasing electronic parts, comprising a carrier tape made from a material selected from the group consisting of paper, aluminum, and thermoplastic resin and having a plurality of recesses for encasing electronic parts and a plurality of guide perforations, said carrier tape having a cover tape pasted thereon with an adhesive in such a way as to seal only the recesses for electronic parts, while leaving the guide perforations open, said cover tape being a nylon-based resin sheet and said adhesive being an ethylene-vinyl acetate copolymer-based adhesive, the peeling adhesivity between the carrier tape and the cover tape being in a range of not more than 70 gf (g/0.6 mm width) and not less than 10 gf (g/0.6 mm width) both at the initial stage and after heat aging at 60° C. for 24 hours, and the difference between maximum peeling adhesivity and minimum peeling adhesivity being not more than 35 gf (g/0.6 mm width).

4,963,406

ABSORBENT PAPER TOWEL OR TISSUE PRODUCT

Chester W. Gooding, Jr., and Maurice J. Mead, both of Neenah, Wis., assignors to James River Corporation of Virginia, Richmond, Va.

Filed Oct. 20, 1988, Ser. No. 260,407

Int. Cl.[5] B32B 3/10

U.S. Cl. 428—43 1 Claim

1. An absorbent web in strip or roll form which comprises multiple plies of absorbent cellulosic or other fibrous material adapted for separation into separate sheets by lines of weakness extending transversely of the strip, and wherein the sheets are delimited by three parallel lines of weakness, the central line of weakness comprising knife cuts having a length and spacing such that is has a lower tear strength than the adjacent lines of weakness whereby a sheet detached from the strip separates from the strip primarily along the central line of weakness and the remaining lines of weakness maintain a bond between plies.

4,963,407

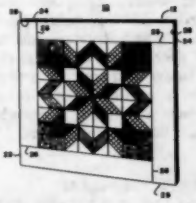
DECORATIVE ARTICLE AND METHOD OF CONSTRUCTING SAME

Charles F. Detweiler, and Linda J. Detweiler, both of 2708 N. Hickory St., Sherman, Tex. 75090

Filed Mar. 20, 1989, Ser. No. 326,071

Int. Cl.[5] B44C 1/28

U.S. Cl. 428—47 20 Claims



10. A decorative article, comprising:

a substrate having a grid pattern on a major surface thereof; and

a plurality of construction members and frame members assembled on said substrate to effect a predetermined decorative design by the following steps:

positioning said frame members on said substrate such that said frame members surround said grid pattern to define a rectangular frame therefor and holding said frame members in position on the substrate;

applying adhesive material to a portion of the grid pattern;

placing selected ones of the construction members at respective selected positions on said portion of said grid pattern and allowing said adhesive material to bond said

selected ones of said construction members to the substrate;

iteratively repeating the aforementioned two steps until the predetermined decorative design is effected;

removing the frame members from the substrate after the predetermined design is effected and applying adhesive material to portions of the substrate surrounding the decorative design; and

repositioning the frame members on the portions of the substrate surrounding the decorative design and allowing the adhesive material to bond the frame members to the substrate to define a substantially permanent frame for the decorative design.

4,963,408

STRUCTURAL UNITARY COMPOSITE LAMINATE STRUCTURE AND METHOD FOR MAKING SAME

Ronald Huegli, Battle Ground, Wash., assignor to Mono-Lite Corporation, Battleground, Wash.

Filed Jun. 13, 1988, Ser. No. 206,178
Int. Cl.[5] B32B *5/12, 3/26*
U.S. Cl. 428—71 **14 Claims**

1. A unitary composite laminate structure comprising:

an inner core layer and an outer encapsulating layer coadhered one to the other by a bonding material for fusing together said inner and outer layers to produce said unitary structure, and a high shear strength, load-bearing matrix comprising a plurality of uncrimped, load-bearing synthetic filaments which are physically connected together to prevent movement of said filaments under load conditions, said load-bearing matrix disposed between said respective inner core layer, said outer encapsulating layer, being oriented substantially entirely int he load bearing direction, said unitary composite structure including means attached to said load-bearing matrix for absorbing forces imparted to said structure and thereby minimizing the effects of shear stress and being capable of resisting delamination under load conditions requiring high tensile and high shear strength, and said force absorbing means comprising a mat of synthetic fibers which are physically attached to said load-bearing matrix.

4,963,409

STAIN RESISTANT POLYMERS AND TEXTILES

Theodor A. Lim, and Leonard H. Beck, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 943,335, Dec. 31, 1986, abandoned, which is a continuation of Ser. No. 829,230, Feb. 14, 1986, abandoned. This application Nov. 23, 1987, Ser. No. 124,866
Int. Cl.[5] B32B *27/12, 27/34, 27/42;* D06M *15/41*
U.S. Cl. 428—96 **8 Claims**

1. A synthetic polyamide textile substrate having deposited thereon a modified polymeric sulfonated phenol-formaldehyde condensation product comprising one (a) in which between about 10 to 25% of the polymer units contain $SO_3(-)$ radicals and about 90 to 75% of the polymer units contain sulfone radicals and (b) in which a portion of the free hydroxyl groups thereof has been acylated or etherified, the number of said hydroxyl groups which has been acylated or etherified being sufficient to inhibit yellowing of said condensation product but insufficient to reduce materially the capacity of said condensation product to impart stain resistance to said synthetic polyamide textile substrate.

4,963,410

FASTENING MECHANISM

Judson D. Bryant, 1918 Shannon Valley, Houston, Tex. 77077

Filed Oct. 3, 1988, Ser. No. 252,894
Int. Cl.[5] B32B *3/06*
U.S. Cl. 428—100 **6 Claims**

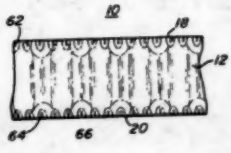
1. Apparatus for securing together a plurality of segments of an elongated member comprising first means for securely engaging at least one of said segments; and band means attached to said first means for encircling additional segments of said elongated member, said band means having surfaces adapted so that when said band means is wrapped onto itself after encircling said additional segments, a first surface of said band means releasably adheres to the opposing surface thereof, and wherein said first means comprises a cinch ring, said band means, and a second band means, the first said band means and said second band means being attached to opposing sides of said cinch ring, and at least one segment of said elongated member is engaged by encircling said segment with the first said band means and pulling the first said band means through said cinch ring until said segment is securely embraced within the first said band means, and thereafter wrapping said second band means around the first said band means, said first and second band means having surfaces that releasably adhere to each other.

4,963,411

DECORATIVE RIBBON GARLAND AND METHOD OF MANUFACTURING SAME

William F. Protz, Jr., Manitowoc, Wis., assignor to National Tinsel Manufacturing Company, Manitowoc, Wis.

Filed Dec. 29, 1988, Ser. No. 291,794
Int. Cl.[5] B32B *3/04;* D04D *9/00*
U.S. Cl. 428—123 **17 Claims**



1. A decorative ribbon made from a thin flexible film comprising:

a web portion having a hem along only the longitudinal edges; and

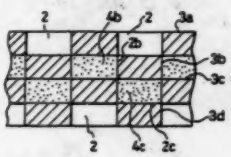
a flexible wire enclosed in and attached to each of said hems, said hems being sealed so as to create smooth finished longitudinal hemmed edges and prevent said flexible wires from being displaced from within said hems, said web portion being selectively displaced during manufacture relative to said flexible wires to form a ruffled pattern for said web portion and said ruffled pattern having generally parallel lines resulting from said displacement of said web portion.

4,963,412

SHEET MATERIAL FOR VEHICLE SAFETY AIR BAGS

Akira Kokeguchi, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan

Filed Jun. 14, 1989, Ser. No. 365,689
Claims priority, application Japan, Jun. 17, 1988, 63-148072
Int. Cl.[5] B32B *3/10*; B60R *21/16*
U.S. Cl. 428—137 9 Claims



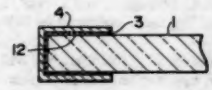
1. Sheet material for use in vehicle safety air bags comprising a multiplicity of perforated films of polymeric material having holes, the holes in the films being free of corners and the perforated films being superposed directly on each other and aligned such that the holes in adjacent films do not entirely overlap, and adhesive filling the holes of all of the perforated films other than the outermost one and uniting them into a laminate.

4,963,413

UNITED PRODUCT COMPOSED OF GLASS PLATE AND VINYL CHLORIDE RESIN MOLDED BODY AND METHOD OF PRODUCING THE SAME

Katsuyuki Amano, Aichi, Japan, assignor to Tokai Kogyo Kabushiki Kaisha, Oobu, Japan

Filed Mar. 21, 1989, Ser. No. 326,563
Claims priority, application Japan, Aug. 27, 1988, 63-213285
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—192 7 Claims



1. A united product having excellent water-resisting qualities comprising:

a glass plate:

a vinyl chloride resin molded body which is formed on the periphery of said glass plate as one body by injection molding; and

a polyamide resin adhesive obtained by reaction of polyamide resin and epoxyalkyl silane, which lies between the periphery of said glass plate and said vinyl chloride resin molded body;

the adhesive strength of said glass plate and said vinyl chloride resin molded body being not less than 1.5 kg/cm in 180 degrees peeling strength and not less than 10 kg/cm^2 in shear strength.—

4,963,414

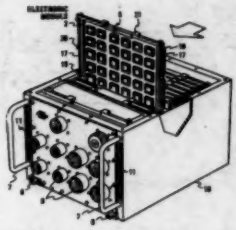
LOW THERMAL EXPANSION, HEAT SINKING SUBSTRATE FOR ELECTRONIC SURFACE MOUNT APPLICATIONS

Robert D. LeVasseur, Binghamton, and Stephen A. McKeown, Endicott, both of N.Y., assignors to General Electric Company, Binghamton, N.Y.

Filed Jun. 12, 1989, Ser. No. 364,409
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—195 19 Claims

1. A heat sinking substrate for surface mounted electronic device packages, said substrate comprising, in combination:

A. a core consisting of a rigid graphitic solid in which hexagonal graphite crystallites are bound together by pitch, said core having opposed, planar surfaces; and



B. a metallic face sheet adhered to each planar surface, each face sheet having a coefficient of thermal of expansion suited to said packages.

4,963,415

PROCESS FOR TEMPERATURE INDICATION OF A HEAT RECOVERABLE ARTICLE

James G. Carlson, Maplewood, and Dean R. Yarian, Dellwood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 11, 1985, Ser. No. 700,393
Int. Cl.[5] B32B *27/06*
U.S. Cl. 428—199 16 Claims

1. A heat-recoverable article capable of shrinking under the influence of heat and containing on its surface to be heated a thermochromic composition capable of changing color when an appropriate temperature has been achieved, said composition comprising a chlorinated polymer and a zinc salt.

4,963,416

METHOD TO REDUCE THE DAMAGE CAUSED BY IONIZING RADIATION TO POLYURETHANE/POROUS EXPANDED POLYTETRAFLUROETHYLENE COMPOSITES BY USE OF HINDERED PHENOLS

Robert M. Thompson, Wilmington, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Nov. 13, 1989, Ser. No. 435,642
Int. Cl.[5] B32B *27/08, 27/40*
U.S. Cl. 428—315.5 3 Claims

1. A composite comprising a polyurethane/expanded porous polytetrafluoroethylene in which a hindered phenol is present in the polyurethane portion.

4,963,417

PRESSURE-SENSITIVE TABLET

Takashi Taniguchi, Yaso; Shoichi Kuroaki, Kouga, and Koichiro Oka, Iberaki, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

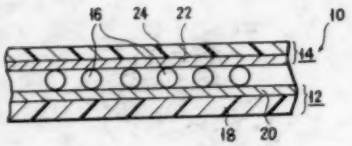
Filed Jul. 1, 1988, Ser. No. 214,438
Claims priority, application Japan, Jul. 3, 1987, 62-167388; Nov. 5, 1987, 62-280105; Feb. 24, 1988, 63-43083
Int. Cl.[5] B32B *5/16*; G08C *21/00*
U.S. Cl. 428—327 18 Claims

1. A pressure-sensitive tablet comprising:

an electro-conductive substrate;

deformable insulative particles with an average particle size of 0.1 μm to 100 μm, distributed on the substrate, said

deformable particles being made of a resin with a deformability of not less than 10%, said deformability being expressed by the following formula:



$$D\,(\%) = \frac{(L_0 - L)}{L_0} \times 100$$

wherein D represents the deformability of the resin constituting the particles, L_0 is the thickness of a block made of the resin when no pressure is applied to the block, and L is the thickness of the block to which a pressure of 20 kg/cm^2 is applied; and an electro-conductive film superimposed on the deformable particles.

4,963,418

THERMO-SHRINKABLE POLYESTER TYPE FILM AND TUBE AND PROCESSING METHOD FOR PREPARING THE TUBE

Tsutomu Isaka, and Toshihiro Yamashita, both of Izuyama, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 890,368, Jul. 29, 1986, abandoned. This application Jan. 26, 1989, Ser. No. 301,827

Claims priority, application Japan, Jul. 31, 1985, 60-170135; Aug. 2, 1985, 60-171476; Oct. 18, 1985, 60-233958; Oct. 18, 1985, 60-233959

Int. Cl.[5] F16L *11/00*; C08G *63/00*; B29C *53/00*

U.S. Cl. 428—34.9 **14 Claims**

1. A thermo-shrinkable polyester type film which is obtained from a material selected from the group consisting of a polyester having a glass transition temperature of no less than 35° C., a polyester copolymer having a glass transition temperature of no less than 35° C., and a mixture of both of said polyester and polyester copolymer with at least one other polymer, wherein said film has the following shrinking properties:

a shrinking ratio in the one axis is not less than 30% of 80° C. and not less than 50% at 100° C., and

a shrinking ratio in perpendicular axis to the former axis is not more than 15% in the range of 55°–105° C., and the minimum value of the shrinking ratio occurs at a temperature in the range of 55°–105° C.; and

having an orientation factor of not more than 100×10^{-3}.

4,963,419

MULTILAYER FILM HAVING IMPROVED HEAT SEALING CHARACTERISTICS

Stanley Lustig, Park Forest; Jeffrey M. Schuetz, Woodridge, and Stephen J. Vicik, Darien, all of Ill., assignors to Viskase Corporation, Chicago, Ill.

Filed May 13, 1987, Ser. No. 49,242

Int. Cl.[5] B32B *27/08, 27/28*; B65B *25/22*

U.S. Cl. 428—36.7 **32 Claims**

1. A multilayer film having improved heat sealing characteristics, which comprises (a) a first outer layer containing a heat sealable thermoplastic polymer having substantial freedom from cross-linking bonds, and (b) a second layer having poor heat sealability and containing a cross-linked ethylene polymer containing siloxane cross-linking bonds.

4,963,420

FILLER AND FLOATABILITY MATERIAL - MANUFACTURING PROCESS AND TUBULAR UNITS THAT INCORPORATE THIS MATERIAL

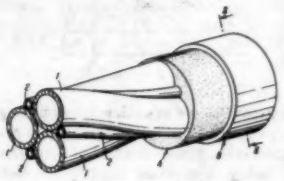
Jacques Jarrin, and Eric Robert, both of Rueil-Malmaison, France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed May 15, 1987, Ser. No. 49,941

Claims priority, application France, May 16, 1986, 86 12460

Int. Cl.[5] B32B *1/08*

U.S. Cl. 428—36.9 **4 Claims**



1. A tubular harness structure which comprises a plurality of tubes that are arranged in close contact with each other thereby providing an assembly of flexible tubes, the assembly being surrounded by an outer sheath made of thermoplastic material, and a floatation material incorporated between the tubes and the outer sheath; said material containing 50–80% by volume of a olefinic homopolymer or copolymer and 50–20% by volume of hollow particulate fly ash microspheres naturally obtained from the soot of pulverized coal power plants.

4,963,421

JOINING POLYOLEFINIC MEMBERS BY FUSION

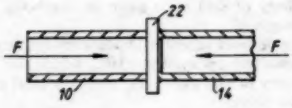
Alan J. Dickinson, Cramlington, and Trevor G. Stafford, Whiteley Bay, both of England, assignors to British Gas plc, London, England

Filed Feb. 21, 1989, Ser. No. 312,513

Claims priority, application United Kingdom, Feb. 19, 1988, 8803957

Int. Cl.[5] B29C *65/10, 65/20*

U.S. Cl. 428—36.9 **17 Claims**



1. A method for joining first and second members each composed of polyolefinic material having an MFI of zero or extremely low value, said method comprising providing between said members a third member composed of polyolefinic material having an MFI which is higher than the MFI of said first and second members; heating respective surfaces of said first, second and third members while said surfaces are separated; engaging said heated surface of said first and third members and said second and third members with each other in mutual alignment at respective first and second interfaces; and pressing said surfaces of said first and third members and said second and third members aginst each other so that the heated surfaces of said third member upset to form beads while the heated surfaces of said first and second members do not upset to form beads, and said first and third members and said second and third members are respectively joined by fusion at said interfaces, the step of heating said respective surfaces compris-

ing passing hot gas over said surfaces to provide heating thereof.

5. Hollow members joined by the method according to claim 1

4,963,422

ETHYLENE VINYL ACETATE ALKYL ACRYLATE COMPOSITIONS FOR FLOCKING ADHESIVES

Howard Katz, Hightstown, N.J., and David J. Lunsford, Mauldin, S.C., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Division of Ser. No. 119,248, Oct. 28, 1987, abandoned, which is a continuation of Ser. No. 904,063, Sep. 4, 1986, abandoned. This application Oct. 11, 1989, Ser. No. 419,924

Int. Cl.[5] B05D 1/14

U.S. Cl. 428—90 9 Claims

1. A process for manufacturing a flocked article which comprises the steps of:

(I) applying to the substrate to be flocked a composition comprising thickeners, pigments, optional foaming agents, and an aqueous emulsion prepared by the emulsion polymerization of:

(a) a vinyl ester of an alkanoic acid having 1 to 13 carbon atoms interpolymerized with the following comonomers:

(b) 10 to 30% by weight of ethylene;

(c) 30 to 50% by weight of a C_4–C_8 alkyl acrylate;

(d) 1 to 5% by weight of an N-methylol containing copolymerizable monomer;

(e) 0 to 4% by weight of an olefinically unsaturated carboxylic acid having 3 to 6 carbon atoms; and

(f) 0 to 1% by weight of a polyethylenically unsaturated comonomer; said adhesive being applied in an amount of 0.5 to 3.0 ounces per square yard;

(II) applying the flocking fibers to the coated substrate; and

(III) drying said flocked substrate.

4,963,423

METHOD FOR FORMING A THIN FILM AND APPARATUS OF FORMING A METAL THIN FILM UTILIZING TEMPERATURE CONTROLLING MEANS

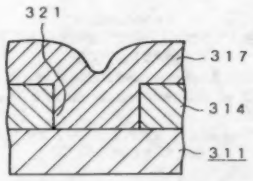
Atsushi Sekiguchi; Tsukasa Kobayashi, and Shinji Takagi, all of Fuchu, Japan, assignors to Anelva Corporation, Tokyo, Japan

Filed Oct. 6, 1988, Ser. No. 253,820

Claims priority, application Japan, Oct. 8, 1987, 62-254268; Feb. 2, 1988, 63-22463; Mar. 25, 1988, 63-71160

Int. Cl.[5] B32B 9/00

U.S. Cl. 428—209 3 Claims



1. In an electronic device having an interconnecting material formed from either an aluminum film or an aluminum alloy film, made by a method of forming said film as a single crystal film, comprising the steps of:

heating a predetermined gas to produce a thermal variation at a first stage;

supplying said heated gas to a surface of a substrate;

heating said substrate to a thermal variation in a second stage; and

forming said film by thermal CVD (chemical vapor deposition) method on said surface of said substrate.

4,963,424

MICROWAVE HEATING MATERIAL

Donald G. Beckett, Acton, Canada, assignor to Beckett Industries Inc., Oakville, Canada

Filed May 19, 1989, Ser. No. 354,217

Claims priority, application United Kingdom, May 20, 1988, 8811918; Aug. 1, 1988, 8818241; Aug. 23, 1988, 8819984

Int. Cl.[5] B32B 3/00

U.S. Cl. 428—209 9 Claims

1. A laminate structure, comprising:

a non-conductive, heat-stable substrate layer,

a metal layer adhered to said substrate layer and having a thickness effective to convert a portion of microwave energy incident thereon to thermal energy, and

a lacquer layer completely overlying said metal layer and said substrate layer and having the same dimensions as said substrate layer and hence is coincident therewith.

4,963,425

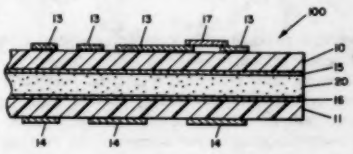
PRINTED WIRING BOARD SUBSTRATE FOR SURFACE MOUNTED COMPONENTS

Alan M. Buchanan, Midvale; Jay S. Abramowitz, Salt Lake City, and Roberta A. Y. Flygare, Salt Lake City, all of Utah, assignors to Unisys Corporation, Blue Bell, Pa.

Filed Mar. 5, 1985, Ser. No. 708,588

Int. Cl.[5] H05K 1/03; B32B 7/02

U.S. Cl. 428—212 20 Claims



1. A composite circuit board structure comprising,

first and second printed wiring boards fabricated of a generally electrically non-conductive material adapted to receive and support thereon at least one component having a coefficient of thermal expansion which is less than the coefficient of thermal expansion of said printed wiring boards, and

a thermoset adhesive layer disposed between and adhered to each of said first and second printed wiring boards,

said adhesive layer having a coefficient of thermal expansion which is less than the coefficient of thermal expansion of said component and capable of restraining the expansion rate of said first and second printed wiring boards whereby the apparent coefficient of thermal expansion of the composite circuit board structure approaches that of each said component.

4,963,426

HEAT-SHRINKABLE LAMINATED FILM

Yoshiharu Nishimoto, and Kengo Yamazaki, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1989, Ser. No. 316,763

Claims priority, application Japan, Mar. 4, 1988, 63-51187

Int. Cl.[5] B32B 27/32, 27/34, 27/08

U.S. Cl. 428—213 7 Claims

1. A heat-shrinkable laminated film of at least two layers comprising:

a mixed aliphatic polyamide resin layer (A) comprising 55 to 90 wt % of an aliphatic polyamide resin having a crystalline melting point of 175° to 240° C. and 45 to 10 wt % of an aliphatic polyamide resin having a crystalline melting point of from not less than 120° C. to less than 175° C., and

a mixed resin layer (B) comprising 70 to 90% of a saponified ethylene-vinyl acetate copolymer and 30 to 1 wt % of a resin selected from the group consisting of a polyester elastomer, a polyamide elastomer, an ethylene-vinyl carboxylate copolymer and an ethylene-acrylate copolymer.

4,963,427

MULTILAYER PACKAGING FILM

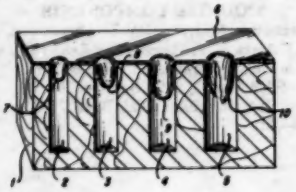
Paolo Botto, and Claudio Freschi, both of Milan, Italy, assignors to W. R. Grace & Co.-Conn., Duncan, S.C.

Continuation of Ser. No. 34,514, Apr. 6, 1987, abandoned. This application Jul. 7, 1989, Ser. No. 376,979

Claims priority, application European Pat. Off., Apr. 15, 1986, 861051993

Int. Cl.[5] B32B *27/08, 27/26, 27/30;* **B65D** *65/40*

U.S. Cl. 428—215 **4 Claims**



1. A vacuum packaging film comprising at least three coextruded layers of which:

(a) a bonding layer comprises a material selected from the group consisting of low density polyethylene, high density polyethylene, ionomer, and mixtures thereof;

(b) a complementary layer comprises an ethylene vinyl acetate copolymer, wherein the vinyl acetate content is in the 15% to 26% range, by weight, the remainder being ethylene; said film being cross-linked;

(c) said complementary layer having a thickness of between about 16 microns and 225 microns; and

(d) an outer layer coextruded with the bonding layer and the complementary layer, said outer layer being provided outwardly on the remote side from said bonding layer, said outer layer comprising a material selected from the group consisting of low density polyethylene, high density polyethylene, linear low density polyethylene, ethylene vinyl acetate copolymer with a vinyl acetate content of 3% to 9% by weight, ionomer, and mixtures thereof.

4,963,428

BIAXIALLY ORIENTED ORDERED POLYMER FILMS

Andrew C. Harvey, Waltham; Richard W. Lusignea, Brighton; James L. Racich, Framingham; Dirk M. Baars, Brighton, all of Mass.; Donald D. Bretches, Waynesboro, Va., and Robert B. Davis, Framingham, Mass., assignors to Foster Miller, Inc., Waltham and Albany International Research Company, Inc., Mansfield, both of, Mass.

Continuation-in-part of Ser. No. 98,710, Sep. 21, 1987, which is a continuation of Ser. No. 780,648, Sep. 26, 1985, abandoned. This application Jun. 13, 1988, Ser. No. 206,137

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—220 **40 Claims**

1. A film having a controllable coefficient of thermal expansion, selected from negative, positive, or zero in any plane of the film and a thickness of at least about 0.10 mm, prepared from a molecularly ordered lyotropic liquid crystalline polymer, said film having a multiaxial molecular orientation.

4,963,429

THIN ORIENTED POLYMER FILMS CONTAINING METAL-ORGANIC COMPOUNDS

Karl H. Norian, Center Valley, Pa., and Ulrich Rieck, Elmshorn/Kolln-Reisiek, Fed. Rep. of Germany, assignors to Wea Manufacturing Inc., Olyphant, Pa.

Filed Dec. 29, 1988, Ser. No. 291,546

Int. Cl.[5] B32B *5/16;* **C08K** *5/04*

U.S. Cl. 428—220 **14 Claims**

1. An oriented crystalline polymer/metal-organic compound film,

(a) said film consisting of (i) an oriented solid continuous polymer matrix (ii) having discontinuous regions of a metal-organic compound (MOC) finely dispersed therein,

(b) said film having a thickness in the range of about 500 Å to 1000 Å,

(c) the polymeric component of said film being a polymer selected from the group consisting of (i) high molecular weight polybutene-1 and (ii) high density polyethylene,

(d) the MOC component of said film being a MOC selected from the group consisting of (i) zinc diethyldithiocarbamate, (ii) aluminum (2)ethylhexanoate, (iii) silver cyclohexanebutyrate, (iv) copper cyclohexanebutyrate, (v) ferric benzoylacetonate, (vi) cobalt cyclohexanebutyrate, and (vii) nickel cyclohexanebutyrate, and

(e) said film, prior to being solidified and oriented, being formed from a liquid emulsion which includes (i) as a continuous phase a solution of said polymer in xylene with (ii) the concentration of the polymer in the solution being between about 0.1% and 5% by weight based on the weight of the solution, and which includes (iii) as a discontinuous phase a multiplicity of finite globules of a solution of said MOC in xylene with (iv) the concentration of the MOC in the solution being between about 5% and 60% by weight based on the weight of a solid MOC-polymer mixture and with (v) said globules being finely dispersed in said solution of said polymer in xylene.

4,963,430

CORROSION AND SPLIT RESISTANT PLASTIC MATERIALS

Frederick A. Kish, Lockport, and Parimal M. Vadhar, Prospect Heights, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Jan. 6, 1989, Ser. No. 294,325

Int. Cl.[5] C08L *67/02*

U.S. Cl. 428—220 **9 Claims**

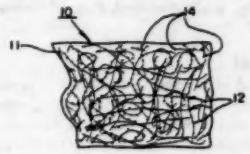
1. A construction article adapted for attachment to a substrate or support element by a headed pointed fastening element comprising an extruded elongated strip substantially mono-axially oriented in the longitudinal dimension and having a thickness of at least 15 mils and a tensile strength of at least 25,000 pounds per square inch in the oriented direction and being resistant to splitting upon penetration by a headed pointed fastening element and being resistant to pull-through of the headed pointed fastening element, said extruded and oriented strip being formed of a composition of from about 80 to 97% by weight of polyethylene terephthalate and from about 3 to 20% by weight of a polyolefin.

4,963,431

ZEOLITE-IMPREGNATED PADS

Joel M. Goldstein, Ambler, Pa., and Thomas M. O'Malley, Uxbridge, Mass., assignors to Aquarium Pharmaceuticals, Inc., Chalfont, Pa.

Filed Jun. 17, 1988, Ser. No. 208,316
Int. Cl.[5] D04H *1/58*
U.S. Cl. 428—288 22 Claims



1. A zeolite-impregnated pad comprising a permeable, nonwoven polymer pad having zeolite bonded substantially throughout the pad by a non-toxic adhesive composition, and adhesive composition being present in an amount sufficient to securely bind the zeolite to the nonwoven polymer pad without adversely affecting zeolite activity.

4,963,432

ONE STEP POLISHING WIPER

Cynthia L. Fuggini, Florida, N.Y., and Allan L. Streit, River Vale, N.J., assignors to Sterling Drug Inc., Rensselaer, N.Y.

Filed Apr. 10, 1989, Ser. No. 335,604
Int. Cl.[5] B32B *27/00*
U.S. Cl. 428—290 18 Claims

1. A wiper for one step polishing and protecting of a hard surface which comprises a nonwoven substrate impregnated with a liquid polish composition comprising by weight of the composition:

(a) from about 0.7 to about 7% of an organic polysiloxane having a viscosity of from about 50 to about 100 centistokes at 25° C.;

(b) from about 0.1 to about 3.5% of an organic polysiloxane having a viscosity of about 1000 to about 25,000 centistokes at 25° C.;

(c) from 0 to about 1.4% of an aminofunctional silicone fluid;

(d) from about 0.1 to about 1% of a wax;

(e) from about 1 to about 15% of a hydrocarbon solvent having an initial boiling point above about 98° C. and an end boiling point below about 200° C.;

(f) from about 0.05 to about 2% of a nonionic emulsifier; and

(g) the remainder to 100% water; wherein the ratio of (a) to (b) is from about 2 to 1 to about 5 to 1, the substrate has a basis weight of from about 30 to about 90 g/sq.yd. and a maximum absorbence capacity of from about to about 8 times its weight, and the polish composition is loaded onto the substrate at about 25 to about 75% of its maximum absorbence capacity.

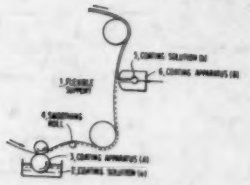
4,963,433

MAGNETIC RECORDING MEDIUM

Hiroshi Ogawa; Yasuo Tamai, and Toshio Kawamata, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 152,221, Feb. 4, 1988, abandoned. This application Jun. 27, 1989, Ser. No. 372,177
Claims priority, application Japan, Feb. 4, 1987, 62-22580
Int. Cl.[5] G11B *5/64*
U.S. Cl. 428—323 8 Claims

1. A magnetic recording medium comprising a non-magnetic support having provided thereon an underlayer containing non-magnetic particles and a binder and an upper layer containing ferromagnetic particles and a binder, has a light transmission degree of 10% or less at 900 nm and has a dry thickness of 0.5 μm or more, wherein said underlayer and said upper layer are provided on said non-magnetic support by a wet-on-wet simultaneous coating method or a wet-on-wet sequential coating method, and wherein said thermoplastic binder in said



underlayer is used in an amount of from 10 to 200 parts by weight per 100 parts by weight of non-magnetic particles in said underlayer.

4,963,434

COMPOSITES OF AROMATIC POLYBENZIMIDAZOLES AND POLYARYLATES

Paul N. Chen, Sr., Gillette; Paul J. Harget, West Milford, and Thomas J. Dolce, Stirling, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Aug. 3, 1988, Ser. No. 229,040
Int. Cl.[5] D02G *3/00*; B32B *9/00, 27/06*
U.S. Cl. 428—378 26 Claims

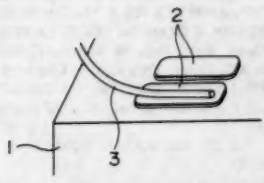
1. A composite comprising a polyarylate or an aromatic polybenzimidazole article and a coating on at least one surface of the article of a blend of from about 5 to about 95 weight percent of an aromatic polybenzimidazole and from about 95 to about 5 weight percent of a polyarylate, total weight percent of the two component polymers in the coating equaling 100.

4,963,435

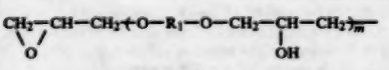
WIRE WITH COATING FOR ULTRASONIC BONDING

Shigeo Hara, Minamiashigara; Setsuo Sekine, Yokohama; Toshio Suzuki, Chigasaki; Minoru Taguchi, Odawara; Akio Mitsuoka, and Yoshiyuki Tetsu, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo; Hitachi Computer Peripherals Co., Ltd., Odawara and Hitachi Cable, Ltd., Tokyo, all of, Japan

Filed Dec. 2, 1988, Ser. No. 279,045
Claims priority, application Japan, Dec. 2, 1987, 62-303364
Int. Cl.[5] B32B *15/00, 15/08*; D02G *3/00*
U.S. Cl. 428—379 2 Claims



1. A wire for a magnetic head with a coated layer for bonding to a joint body by ultrasonic vibration, said coated layer of the wire comprising urethane resin having mixed in a ratio of 5 to 50 wt. % a brominated epoxy resin having the following chemical structure:



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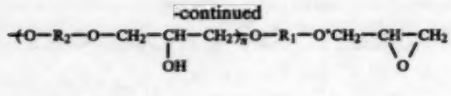
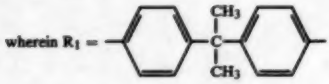
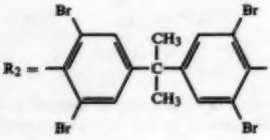






and m and n are greater than or equal to 1.

4,963,436

COATED POROUS MULLITE BODIES

Thomas R. Jones, and Caryl Gould, both of St. Austell, United Kingdom, assignors to ECC International Limited, Great Britain

Division of Ser. No. 22,944, Mar. 6, 1987, Pat. No. 4,826,789, which is a continuation-in-part of Ser. No. 698,323, Feb. 5, 1985, abandoned. This application Aug. 8, 1988, Ser. No. 229,649

Claims priority, application United Kingdom, Feb. 9, 1984, 8403395

Int. Cl.[5] **B32B** *23/12, 25/02, 27/04, 27/14*

U.S. Cl. 428—403 **30 Claims**

1. A coated particulate porous material wherein substantially all the particles of the material are not smaller than 5 micrometers and not larger than 1 millimeter in diameter, wherein each particle is in the form of a substantially cellular body and consists predominantly of an open, three-dimensional matrix of crystals of millite which define between them interconnecting pores having a width in the range of from 5 nanometers to about 5 micrometers and wherein the particles are coated with an organic material containing hydrophilic groups, hydrophobic groups or a mixture of hydrophiclic and hydrophobic groups and which is capable of providing the particles of mullite with affinity chromatography, or ion exchange or biochemical properties.

4,963,437

LIQUID PREPARATION FOR THE PRODUCTION OF ELECTRICALLY CONDUCTIVE AND INFRARED-REFLECTING FLUORINE-DOPED TIN OXIDE LAYERS ON GLASS OR GLASS-CERAMIC SURFACES, AS WELL AS A METHOD FOR THE PRODUCTION OF SUCH LAYER

Erich Ruf, Essen, Fed. Rep. of Germany, assignor to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Sep. 19, 1988, Ser. No. 246,501

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1987, 3735591

Int. Cl.[5] **B32B** *15/00;* **B05D** *5/06*

U.S. Cl. 428—432 **6 Claims**

1. A method of forming an electrically conductive, infrared-reflecting fluorine-doped tin oxide layer on the surface of a glass or glass-ceramic substrate, which comprises:

(a) heating the substrate to a temperature of between about 400°–800° C. but below the melting or softening temperature of the substrate, and

(b) spraying onto the heated substrate a solution obtained by dissolving between about

27.5 to 89.5% by weight of tin-IV chloride, and

0.5 to 5.0% by weight of tin-II fluorosilicate in the form of a 30 to 50% by weight aqueous solution in

10 to 67.5% by weight of a polar organic solvent.

4,963,438

COATING COMPOSITION AND METHOD FOR COATING SHEET-LIKE SUPPORTS BY APPLYING CURABLE ORGANOPOLYSILOXANES MODIFIED WITH (METH) ACRYLATE ESTER GROUPS

Christian Weitemeyer, Essen; Dietmar Wewers, Bottrop, and Juergen Jschmann, Herne, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Feb. 27, 1989, Ser. No. 316,239

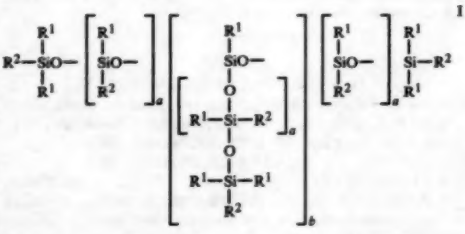
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1988, 3810140

Int. Cl.[5] **B32B** *9/04*

U.S. Cl. 428—447 **11 Claims**

1. In a method of producing an abhesive coating on a substrate by applying a curable organopolysiloxane modified with (meth)acrylate ester groups on the surface of the substrate and curing the modified organopolysiloxane by the action of polymerizing high-energy radiation, the improvement comprising that the curable organopolysiloxane is the reaction product, obtained under esterification conditions of

(A) a polysiloxane of the general average formula



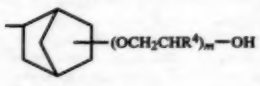
I

wherein

the R^1 groups are the same or different and represent low molecular weight alkyl groups with 1 to 4 carbon atoms or phenyl groups,

the R^2 groups being selected from the groups consisting of

(a) hydroxy-functional groups of the formula $-CH_2(CR^3_2)_n-(OCH_2CHR^4)_m-OH$, $-CH=CH-CR^3_2-OH$ and groups of the formula



wherein

the R^3 groups are the same or different and represent a hydrogen group or an alkyl group with 1 to 4 carbon atoms,

the R^4 groups being the same or different and representing a hydrogen or alkyl group with 1 to 10 carbon atoms, and

the subscripts

n=0 to 10, and

m=0 to 40,

(b) unsubstituted and substituted alkyl groups with 2 to 20 carbon atoms and hydrogen groups, and

(c) R^1 groups, wherein

a has a value of 1 to 1,000, and

b has a value of 0 to 10,

with the proviso that

(i) at least 1.8 hydroxy functional R^2 groups (a) are contained in the average molecule,

(ii) the remaining R^2 groups are of the species (a), (b) or (c), and

(iii) the lower limit value of the ratio between the hy-

droxy-functional R^2 groups of species (a) and the R^2 groups of species (b) is not below 70:30, and

(B) based on hydroxyl groups, 0.4 to 0.9 molar amounts of (meth)acrylic acid and up to 0.6 molar amounts of a monocarboxylic acid, which is free of double bonds capable of polymerizing, the sum of the molar amounts of the acids being not greater than 1.0.

4,963,439

CONTINUOUS FIBER-REINFORCED AL-CO ALLOY MATRIX COMPOSITE

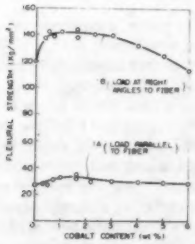
Tadashi Yamamoto; Michiyuki Suzuki; Yoshiharu Waku, and Masahiro Tokuse, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Apr. 17, 1989, Ser. No. 338,668

Claims priority, application Japan, Apr. 19, 1988, 63-94476

Int. Cl.[5] C22C *9/00*

U.S. Cl. 428—614 **12 Claims**



1. A fiber-reinforced metal composite consisting essentially of continuous reinforced metal composite consisting essentially of continuous reinforcing fibers disposed in an Al-Co alloy matrix containing about 0.005 wt% to about 5 wt % of cobalt.

7. A fiber-reinforced metal composite material comprised of continuous fibers disposed in a metal matrix, said metal matrix consisting essentially of an Al—Co alloy containing about 0.5 wt% to about 3 wt% Co, said metal matrix having fine acicular crystals of eutectic Co_2Al_9 at the interface between said fibers and said metal matrix such that the flexural strength of said composite material is greater than the flexural strength of a composite material having said continuous fibers disposed in a pure aluminum metal matrix.

4,963,440

AL-CR ALLOY VAPOR-DEPOSITED MATERIAL

Kazutoshi Shimogori; Hiroshi Satoh, both of Kobe; Masao Toyama, Mino; Hidetoshi Nishimoto, Miki; Koki Ikeda, Kobe, and Junji Kawafuku, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

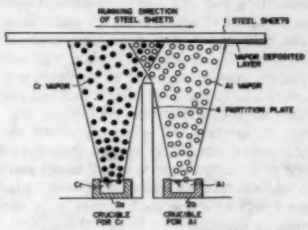
Filed Jan. 19, 1989, Ser. No. 298,894

Claims priority, application Japan, Jul. 9, 1987, 62-171661; Jul. 9, 1987, 62-171659; Jul. 9, 1987, 62-171660; Jul. 15, 1987, 62-177832; Jul. 15, 1987, 62-177829; Jul. 15, 1987, 62-177830; Jul. 15, 1987, 62-177831; Oct. 8, 1987, 62-255493; Nov. 9, 1987, 62-282827; Jan. 20, 1988, 63-11650

Int. Cl.[5] B32B *15/01*

U.S. Cl. 428—651 **15 Claims**

1. An Al-Cr alloy vapor deposited product having high corrosion resistance which comprises a substrate metal and an Al-Cr alloy layer deposited on said substrate metal, wherein said substrate metal was heated to about 100° to 450° C. during the vapor deposition step, said alloy consisting essentially of



Al, Cr, and θ phase $Al_{13}Cr_2$ wherein said alloy contains 1 to 50 wt % of Cr.

4,963,441

LIGHT-STORING GLAZES AND LIGHT-STORING FLUORESCENT CERAMIC ARTICLES

Ryuzo Takai, and Masao Miyadai, both of Shiga, Japan, assignors to Shiga Prefecture, Otsu, Japan

Continuation of Ser. No. 613,656, May 24, 1984, abandoned. This application Dec. 13, 1985, Ser. No. 808,853

Int. Cl.[5] B32B *18/00*; C09K *11/00*

U.S. Cl. 428—690 **8 Claims**

1. A composition for forming a light-storing glaze layer over a ceramic article comprising (a) a mixture of base components for a frit consisting of: per 100 parts by weight of the mixture (a), about 10 to about 50 parts by weight of B_2O_3, about 1 to about 20 parts by weight of Al_2O_3, 0 to about 10 parts by weight of ZnO, about 2 to about 15 parts by weight of Na_2O, 0 to about 60 parts by weight of SiO_2, 0 to about 15 parts by weight of CaO, 0 to about 5 parts by weight of K_2O and 0 to about 5 parts by weight of MgO, and (b) about 20 to about 80 parts by weight of sulphide-type light-storing fluorescent material per 100 parts by weight of the mixture (a).

4,963,442

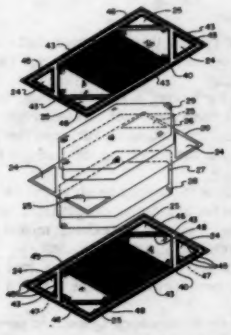
INTERNAL MANIFOLDED MOLTEN CARBONATE FUEL CELL STACK

Leonard G. Marianowski, Mount Prospect, Ill., and Randy J. Petri, Highland, Ind., assignors to Institute of Gas Technology, Chicago, Ill.

Filed May 3, 1989, Ser. No. 346,666

Int. Cl.[5] H01M *2/08, 8/14*

U.S. Cl. 429—13 **20 Claims**



1. In a generally rectangular molten carbonate fuel cell stack comprising a plurality of molten carbonate fuel cell units, each

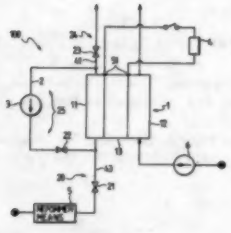
said fuel cell unit comprising an anode and a cathode, an alkali metal carbonates electrolyte in contact with one side of said anode and an alkali metal carbonates electrolyte in contact with an opposite facing side of said cathode, and a separator plate separating said cell unit between said anode and cathode forming an anode chamber between one side of said separator plate and said anode and a cathode chamber between the opposite side of said separator plate and said cathode, the improvement comprising; said electrolytes and said separator plates extending to the edge of said fuel cell stack, said separator plates having a flattened peripheral wet seal structure extending to contact said electrolytes on each side of said separator plates completely around their periphery forming a separator plate/eleotrolyte wet seal under cell operating conditions, said electrolytes and said separator plates each having an aligned perforation in each corner area, each said perforation being surrounded by a flattened manifold wet seal structure extending to contact said electrolytes on each side of said separator plates forming a separator plate/electrolyte wet seal under cell operating conditions to form a gas manifold in each corner area extending through said cell stack, conduits through said extended manifold wet seal structure providing gas communication between one of said manifolds at each end of said separator plates and said anode chambers on one side of said separator plates and conduits through said extended manifold wet seal structure providing gas communication between the other of said manifolds at each end of said separator plates and said cathode chambers on the other side of said separator plates, thereby providing internal manifolding of fuel and oxidant gases to each said unit fuel cell in said fuel cell stack.

4,963,443

FUEL CELL SYSTEM AND THE METHOD FOR OPERATING THE SAME

Tomoyoshi Kamoshita, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Jun. 12, 1989, Ser. No. 364,273
Claims priority, application Japan, Jun. 23, 1988, 63-155573
Int. Cl.[5] H01M *8/18*
U.S. Cl. 429—17 **7 Claims**



1. A fuel cell system that generates electricity and, at the termination of operation, replaces purged gas, the fuel cell system comprising:

a fuel cell body having a fuel electrode, an oxidizer electrode, and a matrix in which an electrolyte is impregnated;

reformer means for reforming fuel into fuel gas;

supplying means for supplying the fuel gas to the fuel electrode;

air blower means for supplying air to the oxidizer electrode;

exhaust means for exhausting off gas from the fuel electrode;

closing means for closing the exhaust means when operation of the fuel cell system is terminated;

circulating means for circulating the fuel gas in the fuel electrode when operation of the fuel cell system is terminated; and

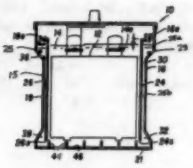
discharge means for discharging electric power when operation of the fuel cell is terminated, whereby non-inflammable gas, mainly containing non-reactive compounds in which hydrogen contained in the fuel gas is fully consumed, is filled in said fuel cell body when said operation of the fuel cell system is terminated.

4,963,444

INTERNAL HYDROSTATIC PUMP FOR A MOBILE VEHICLE BATTERY

William C. Delaney, Saukville, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 201,042, May 31, 1988, abandoned. This application May 30, 1989, Ser. No. 358,688
Int. Cl.[5] H01M *2/38*
U.S. Cl. 429—67 **15 Claims**



1. A battery cell for use in an environment wherein said cell is subject to changes in velocity,

said cell having a surface substantially enclosing a volume partially filled with electrolyte,

said cell including a hydrostatic pump having a structure defining a mouth region and a hollow throat, said mouth region positioned substantially above the surface of said electrolyte when at-rest and for receiving electrolyte in the form of laterally moving surface waves when said electrolyte is disturbed by a change of velocity of said cell thereby creating a hydrostatic head within said pump, said throat communicating with said mouth, extending downwardly with an opening at its end into said cell, said throat thereby providing a channel for the dissipation of said hydrostatic head,

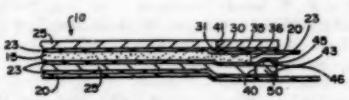
said mouth region having an average horizontal cross-sectional area sufficiently greater than the average horizontal cross-sectional area of said throat such that upward velocity of electrolyte occurring within said throat due to said change of velocity of said cell is substantially reduced upon entering said mouth region.

4,963,445

ELECTROCHEMICAL CELLS HAVING SPIRALLY WOUND ELECTRODE ASSEMBLIES

Jack W. Marple, Elyria, and Samuel D. Navé, Avon Lake, both of Ohio, assignors to Eveready Battery Co., Inc., St. Louis, Mo.

Filed May 8, 1989, Ser. No. 348,367
Int. Cl.[5] H01M *6/10*
U.S. Cl. 429—94 **32 Claims**



1. A spirally wound electrode assembly comprising alternating layers of a cathode and an anode, wherein the anode and cathode layers have a layer of electrically insulating, ionically permeable separator positioned therebetween; wherein the outer electrode layer is an anode layer; said assembly further comprising an ionically impermeable, electrically insulating overwrap film disposed about the wound layers of cathode,

anode and separator, said film having a first section extending into the end of the wound layers of cathode, anode and separator on one side of the outermost cathode layer; said outer anode layer further having an anode tab located thereon at a tab location portion which is directly radially outward of the first section of the overwrap film.

4,963,446

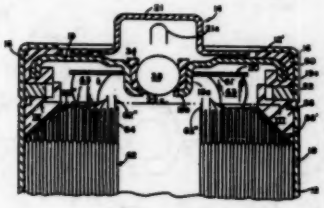
INWARDLY INDENTED EDGE ELECTRODE ASSEMBLY

Timothy J. Roels, Rocky River, and Jeannine L. Affeldt, Avon Lake, both of Ohio, assignors to Eveready Battery Co., Inc., St. Louis, Mo.

Filed Apr. 5, 1989, Ser. No. 333,602

Int. Cl.[5] H01M *6/10*

U.S. Cl. 429—94 **19 Claims**



1. A jelly roll type electrode assembly for a galvanic cell comprising a cylindrical container, a pair of first and second electrodes and at least one separator sheet, in the form of a cylindrical wound jelly roll in said container;

said first electrode comprising a conductive carrier foil and a layer of active electrode material supported on at least one side of said foil;

said jelly roll assembly being retained in said container with the edges of said foil and separator sheet oriented axially therein, one of said axial foil edges being dimensioned to project axially beyond said axial separator sheet edges to be exposed in the form of a helix of several turns of foil;

at least the outermost turns of said projecting foil edges being radially inwardly indented away from said container at spaced circumferential intervals to form spaced indentations for preventing electrical contact between said foil edges and said container and for adding strength to said foil edges for electrical contact therewith;

openings remaining between said foil edges in the areas between said spaced intervals for ready filling of said cell with a fluid electrolyte;

said indentations being in a regular pattern of a plurality of deep crevasses at said intervals and lesser sloped ridges between said intervals; and

an annular insulator material engaging said ridges.

4,963,447

ALKALINE CELL WITH GELLED ANODE

Joji Nishimura, Hirakata; Yuji Mototani, Yawata; Junichi Asaoka, Ikoma; Noriyuki Yanagawa, Yokohama, and Hiroshi Touma, Hiratsuka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka and Nihon Junyaku Co., Ltd., Tokyo, both of, Japan

Filed Feb. 8, 1990, Ser. No. 476,755

Int. Cl.[5] H01M *4/62, 4/02*

U.S. Cl. 429—206 **8 Claims**

1. An alkaline cell comprising a positive electrode, an alkaline electrolyte and a gelled negative electrode, the gelled negative electrode being mainly composed of the alkaline electrolyte, a gelling agent and a zinc powder, wherein the gelling agent is solely or mainly composed of a granular cross-linking type branched carboxyvinyl polymer of a main particle

diameter of 200 to 900 microns which is granulated during or after deposition-polymerization thereof.

4,963,448

PHOTORECORDING ELEMENT AND LIQUID CRYSTAL CELL COMPRISING THE SAME

Kunihiro Ichimura; Yasuzo Suzuki; Takahiro Seki; Masako Sakuragi, all of Tsukuba; Takashi Tamaki, Ibaraki; Akira Hosoki, and Koso Aoki, both of Tsukuba, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Aug. 31, 1988, Ser. No. 238,398

Claims priority, application Japan, Aug. 31, 1987, 62-217317; Mar. 30, 1988, 63-77785; Mar. 30, 1988, 63-77786

Int. Cl.[5] G03C *1/685, 1/73; G02F 1/1337; C09K 9/52*

U.S. Cl. 430—20 **10 Claims**

1. A photorecording element consisting of:

a transparent substrate;

one or more monomolecular layers of photochromic compound disposed in direct contact with said transparent substrate and capable of reversibly changing its structure by virtue of light; and

a layer of liquid crystals of one type selected from the group consisting of nematic, smectic and cholesteric types, said layer of liquid crystals being disposed in direct contact with said layer of photochromic compound and the long axes of said liquid crystals being arranged perpendicular to the surface of the substrate so that when the photochromic compound is exposed to light and consequently changes its structure, the long axes of said liquid crystals rearrange in the parallel direction to said surface.

4,963,449

P-AMINO SUBSTITUTED TETRAPHENYLTHIOPHENES AND ELECTROPHOTOGRAPHIC PHOTORECEPTORS CONTAINING THEM

Yasuyuki Yamada, Yokohama; Hisato Itoh, Yokohama; Akihiro Yamaguchi Kamakura; Masakatsu Nakatsuka, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

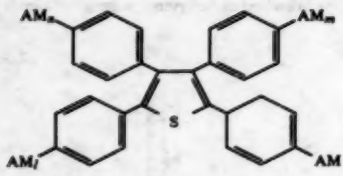
Filed Nov. 17, 1988, Ser. No. 272,371

Claims priority, application Japan, Nov. 17, 1987, 62-288311; Dec. 16, 1987, 62-316019; Jan. 11, 1988, 63-002459; Jan. 13, 1988, 63-003685

Int. Cl.[5] G03G *5/06*

U.S. Cl. 430—59 **13 Claims**

1. An electrophotographic photoreceptor comprising an electrically conductive base and a photosensitive layer thereon containing a charge-generating material and a charge-transporting material wherein said charge-transporting material comprises a tetraphenylthiophene of the formula



wherein AM is a tertiary amino group and each of l, m and n is the integer 0 or 1 and l≧m≧n.

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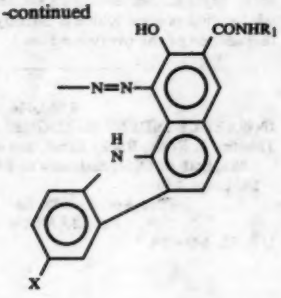
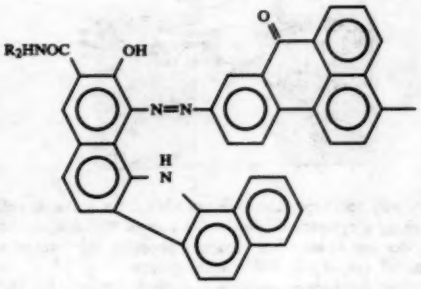
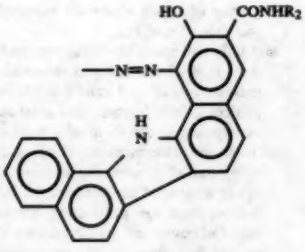
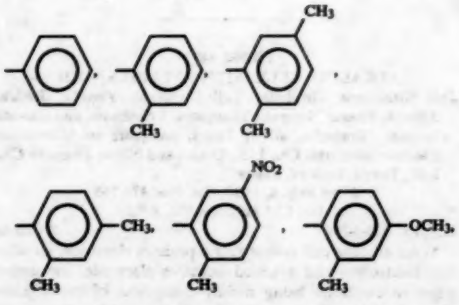


Formula (2)





wherein R_1 and R_2 each is a group selected from the group consisting of:

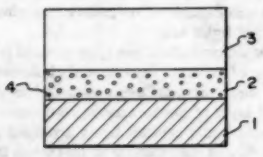


4,963,450

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER WITH DISAZO PIGMENT

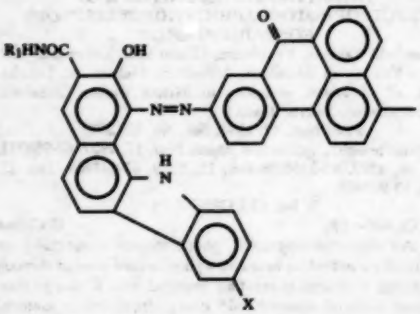
Hajime Miyazaki; Shinietsu Go; Akihiro Senoo; Kazushi Iuchi, all of Yokohama, and Tetsuro Kanemaru, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1989, Ser. No. 296,790
Claims priority, application Japan, Jan. 14, 1988, 63-007300
Int. Cl.[5] G03G 5/06, 5/047
U.S. Cl. 430—59 6 Claims



1. A laminated layer type electrophotographic photosensitive member having a charge generation layer and a charge transport layer on an electroconductive support, characterized in that the charge generation layer has at least one of disazo pigments is by the formulae (1) and (2);

Formula (1)



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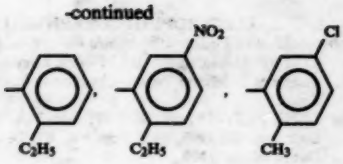


and X is halogen atom.

2. An electrophotographic photosensitive member according to claim 1, wherein the charge transport substance contained in the charge transport layer is a compound selected from the group consisting of hydrazone compounds, pyrazoline compounds, arylamine compounds, oxazole compounds and triarylmethane compounds.

4,963,451

1,2,4,5-BENZOYLENEBIS(ANTHRAQUINONE[1,2-d]IMIDAZOLE) COMPOUNDS AND PHOTOSENSITIVE MEMBERS CONTAINING THEM

Satoshi Katayama, Tenri; Yoshihide Shimoda, Nara; Hiroshi Sugimura, Habikino; Eiji Imada, Nara, and Shuhei Tsuchimoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 280,972, Dec. 7, 1988, Pat. No. 4,908,457. This application Sep. 22, 1989, Ser. No. 410,890

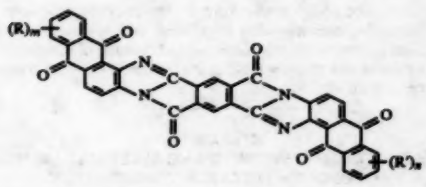
Claims priority, application Japan, Dec. 8, 1987, 62-310466

Int. Cl.[5] G03G *15/05, 15/06*

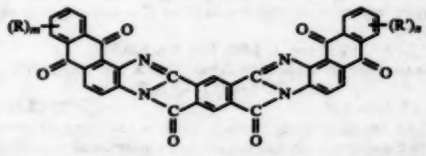
U.S. Cl. 430—72 **10 Claims**

1. A photosensitive member comprising a photosensitive layer on a conductive support, said photosensitive layer containing a compound of the group of 1,2,4,5-Benzoylenebis(anthraquinone(1,2-D)imidazole) compounds represented by the following general formulas (1) or (2):

(1)



(2)



wherein R and R' each are a hydrogen atom, a halogen atom, an hydroxyl group, a lower alkyl group, a lower alkoxy group or an aryl group which may be substituted and m and an each are an integer of 1 or 2.

4,963,452

PHOTOSENSITIVE MEMBER FOR INPUTTING DIGITAL LIGHT

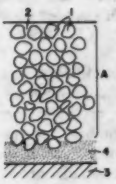
Koichi Kinoshita, 34-13, Nishi-Kusabuka-cho, Shizuoka-shi, Shizuoka-ken, Japan

Filed Oct. 20, 1988, Ser. No. 260,683

Claims priority, application Japan, Dec. 25, 1987, 62-32865

Int. Cl.[5] G03G *5/06, 5/087*

U.S. Cl. 430—78 **15 Claims**



1. A digital photosensitive member for use in electrophotography by utilizing avalanche phenomenon, comprising:

photoconductive fine crystals of an intrinsic semiconductor or an amorphous semiconductor, said fine crystals having a mean particle diameter of about 0.01μ–0.5μ; and

a binder having a volume specific resistivity higher than 10^{13} ohm-cm,

said photoconductive fine crystals being dispersed in said binder so that substantially all of said fine crystals are electrically insulated from their neighbors by said binder; and

a resultant mixture of said fine crystals and binder being formed as a thin film having a thickness of about 5μ–30μ, and a γ of a latent image formed in said film having a value larger than 6.

4,963,453

PHOTOSENSITIVE MEMBERS FOR USE IN ELECTROPHOTOGRAPHY

Koichi Kinoshita, 34–13, Nishi-Kusabuka-Cho, Shizuoka-Shizuoka-Ken, Japan; Shizuoka, Japan, assignor to Koichi Kinoshita, Shizuoka, Japan

Continuation of Ser. No. 81,999, Aug. 5, 1987, abandoned. This application Feb. 8, 1989, Ser. No. 308,996

Claims priority, application Japan, Apr. 21, 1987, 62-97971

Int. Cl.[5] G03G *5/05*

U.S. Cl. 430—96 **20 Claims**

1. A photosensitive member for use in electrophotography comprising:

an electroconductive substrate;

a photosensitive layer comprising a photoconductive material on said substrate;

said photosensitive layer comprising a mixture of a binder of a self-hardening type resin and a finely divided powder of a photoconductive material;

said photosensitive layer having a mirror finish with a surface irregularity of less than 0.1 μ.

4,963,454

METHOD FOR DEVELOPING ELECTROSTATIC IMAGES USING MAGNETIC BRUSH

Koji Yano, Tokyo; Nobuhiro Miyakawa, Ashiya; Teruaki Higashiguchi, Tokyo; Kazuo Yamamoto, Tokyo, and Yoshinobu Kawakami, Tokyo, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 702,687, Feb. 19, 1985, abandoned. This application Oct. 3, 1986, Ser. No. 914,579

Claims priority, application Japan, Feb. 17, 1984, 59-27351

The portion of the term of this patent subsequent to Sep. 16, 2005, has been disclaimed.

Int. Cl.[5] G03G 13/09

U.S. Cl. 430—106.6 7 Claims

1. A developing method for forming a toner image corresponding to an electrostatic image by bringing an electrostatic image-bearing surface of a photosensitive plate into sliding contact with a magnetic brush consisting of a mixture of magnetic carrier of an indeterminate shape and an electroscopic toner, wherein development is carried out at a toner concentration, in said mixture, which satisfies the requirement represented by the following formula:

$$Ct = k \cdot \frac{Sc}{St + Sc} \times 100$$

wherein

Ct stands for said toner concentration in percent by weight,

Sc stands for the specific surface area (cm^2/g) of the carrier determined by the transmission method of the Japanese Powder Industry Association,

St stands for the specific surface area (cm^2/g) of the toner calculated according to the formula

$$St = \frac{3}{r \cdot \rho}$$

wherein r represents the radius (cm) determined from the volume average particle size of the toner measured by a Coulter counter, and ρ represents the true specific gravity (g/cm^3) of the toner, and k is a number of from 0.90 to 1.14.

4,963,455

DEVELOPER COMPOSITIONS WITH SUSPENSION POLYMERIZED STYRENE BUTADIENE RESINS

John R. Laing, Rochester; Hui Chang, Pittsford; Richard D. Manca, Fairport, and Angelo J. Barbetta, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 81,261, Aug. 3, 1987, abandoned. This application Oct. 27, 1989, Ser. No. 428,372

Int. Cl.[5] G03G 9/083, 9/087, 9/113

U.S. Cl. 430—106.6 35 Claims

1. Developer compositions with toner compositions comprised of suspension polymerized styrene butadiene polymers, pigment particles, and charge enhancing additives; and carrier components comprised of a carrier core with a coating thereover comprised of a polymer mixture with from about 10 to about 90 percent by weight of a first polymer, and from about 90 to about 10 percent by weight of a second polymer, which first and second polymers are not in close proximity in the triboelectric series.

4. A developer composition in accordance with claim 1 wherein the pigment particles are carbon black, magnetites, or mixtures thereof.

4,963,456

ELECTROPHOTOGRAPHIC TONER

Masaaki Shin, Fujisawa; Nobuhiro Hirayama; Keiichi Ishikawa, all of Yokohama, and Akira Misawa, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

PCT No. PCT/JP87/00718, § 371 Date Feb. 22, 1989, § 102(e) Date Feb. 22, 1989, PCT Pub. No. WO89/00717, PCT Pub. Date Jan. 26, 1989

PCT Filed Sep. 30, 1987, Ser. No. 320,301

Claims priority, application Japan, Jul. 10, 1987, 62-171087

Int. Cl.[5] G03G 9/08, 11/00

U.S. Cl. 430—109 16 Claims

1. An electrophotographic toner which comprises containing 30–80% by weight of a polymer per total weight of a resin included in the toner, said polymer being obtained by continuously feeding a vinyl monomer, a polymerization initiator and a solvent into a system of 190°–230° C. to conduct polymerization under a liquid state, and said polymer being a vinyl polymer having a number average molecular weight of 1,000–5,000 and a glass transition temperature of 40°–75° C.

4,963,457

PHOTOSENSITIVE, PRESSURE-SENSITIVE RECORDING SHEET OF PLAIN PAPER TRANSFER TYPE COMPRISING WAX

Toshihiko Matsushita; Shigetoshi Hiraishi, both of Tokyo, and Sadao Morishita, Ibaraki, all of Japan, assignors to Mitsubishi Paper Mills, Ltd, Tokyo, Japan

Continuation of Ser. No. 857,251, Apr. 30, 1986, abandoned. This application Jun. 15, 1989, Ser. No. 368,153

Claims priority, application Japan, Apr. 30, 1985, 60-93263; Apr. 30, 1985, 60-93264; Mar. 10, 1986, 61-53300

Int. Cl.[5] G03C 1/68, 1/87, 5/54

U.S. Cl. 430—138 24 Claims

1. A plain paper type transfer imaging system comprising a photosensitive, pressure-sensitive recording sheet and a plain paper coated with at least one of a metal compound and an inorganic pigment, wherein said recording sheet comprises a transparent or semi-transparent substrate and a photosensitive, pressure-sensitive layer formed on one side of said substrate and said photosensitive, pressure-sensitive layer is one consisting essentially of (1) microcapsules containing a photocurable resin and a reactant, (2) at least one of (a) microcapsules containing a photocurable resin and a coreactant, (b) microcapsules containing a coreactant and (c) a coreactant in fine powder form, wherein all of the coreactants in (a), (b) and (c) are capable of reacting with said reactant to form a colored substance, and (3) a wax,

whereby the photocurable resin in the microcapsules converts the microcapsules into rigid microcapsules upon light exposure, thereby controlling breakage of the microcapsules and thereby making it possible to conduct transfer recording.

4,963,458

IMAGE FORMING METHOD AND MATERIAL USING PHOTOPOLYMERIZABLE COMPOSITION

Shunichi Ishikawa, and Fumiaki Shinozaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 6, 1988, Ser. No. 240,327

Claims priority, application Japan, Sep. 3, 1987, 62-220795

Int. Cl.[5] G03C 1/72, 8/00

U.S. Cl. 430—138 33 Claims

1. An image forming method using a recording element which comprises a recording layer on a support, said recording layer containing at least two active components of a photopolymerizable composition, said components being selected from the group consisting of a polymerizable compound, a photopolymerization initiator, a sensitizer and an oxygen scavenger, and said components being separated from each other by the

shell of microcapsules in such manner that at least one component is contained in the microcapsules which are dispersed in the recording layer and the other component is arranged outside of the microcapsules with the proviso that the polymerizable compound is contained only in the microcapsules,

wherein the image forming method comprises the steps of:

uniformly heating the recording element at a temperature of 70° to 300° C. to bring the component outside of the microcapsules into contact with the component in the microcapsules by permeation of at least one of the components through the shell of the microcapsules without rupturing the microcapsules; and

simultaneously or thereafter imagewise exposing to light the recording element to imagewise polymerize the composition.

10. An image forming method using a recording element which comprises a recording layer on a support, said recording layer containing at least two active components of a photopolymerizable composition, said components being selected from the group consisting of a polymerizable compound, a photopolymerization initiator, a sensitizer and an oxygen scavenger, and said components being separated from each other by the shell of microcapsules in such manner that at least one component is contained in the microcapsules which are dispersed in the recording layer and the other component is arranged outside of the microcapsules with the proviso that the polymerizable compound is contained only in the microcapsules,

wherein the image forming method comprises the steps of:

imagewise heating the recording element at a temperature of 70° to 500° C. to bring the component outside of the microcapsules into contact with the component in the microcapsules by permeation of at least one of the components through the shell of the microcapsules without rupturing the microcapsules; and

simultaneously or thereafter uniformly exposing to light the recording element to polymerize the composition within the heated area.

19. An image forming method using a recording element which comprises a recording layer on a support, said recording layer containing a photopolymerizable composition and a polymerization inhibitor, said polymerization inhibitor being selected from the group consisting of p-methoxyphenol, hydroquinone, an alkyl substituted hydroquinone, an aryl substituted hydroquinone, t-butylcatechol, naphthylamine, β-naphthol, nitrobenzene, dinitrobenzene and p-toluidine, and said composition and inhibitor being separated from each other by the shell of the microcapsules in such manner that the photopolymerizable composition is contained in the microcapsules which are dispersed in the recording layer and the polymerization inhibitor is arranged outside of the microcapsules,

wherein the image forming method comprises the steps of:

imagewise heating the recording element at a temperature of 70° to 500° C. to bring the polymerization inhibitor into contact with the photopolymerizable composition by permeation of at least one of the photopolymerizable or the polymerization inhibitor through the shell of the microcapsules without rupturing the microcapsules; and

simultaneously or thereafter uniformly exposing to light the recording element to polymerize the photopolymerizable composition outside of the heated area.

26. A recording element which comprises a recording layer on a support, wherein the recording layer contains a photopolymerizable composition and a polymerization inhibitor, said polymerization inhibitor being selected from the group consisting of p-methoxyphenol, hydroquinone, an alkyl substituted hydroquinone, an aryl substituted hydroquinone, t-butylcatechol, naphthylamine, β-naphthol, nitrobenzene, dinitrobenzene and p-toluidine, said composition and inhibitor being separated from each other by the shell of microcapsules in such manner that the photopolymerizable composition is contained in the microcapsules which are dispersed in the recording layer and the polymerization inhibitor is arranged outside of the microcapsules.

4,963,459

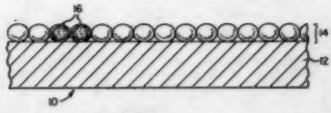
SYSTEM FOR REGISTERING TO A MOVING WEB

Jack Beery, Centerville, and David A. Boyer, Miamisburg, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 287,540, Dec. 16, 1988, abandoned, which is a continuation of Ser. No. 106,202, Oct. 8, 1987, abandoned. This application Aug. 25, 1989, Ser. No. 399,434

Int. Cl.[5] G03C *1/68, 1/72*

U.S. Cl. 430—138 **16 Claims**



1. A method of registering to an imaging web moving within an imaging web handling apparatus along an imaging web path, said imaging web comprising a support having a coating of photosensitive microcapsules on the surface thereof, said photosensitive microcapsules having an internal phase of a color former and a photosensitive composition sensitive to radiation of at least a first wavelength and insensitive to radiation of at least a second wavelength, the method comprising the steps of:

forming a registration mark on said imaging web by exposing a first portion of said imaging web to actinic radiation of said first wavelength so that said first portion undergoes a color or reflection change with respect to the remaining second portion of said imaging web;

detecting said registration mark by directing onto said moving imaging web radiation of said second wavelength, and receiving onto a photoresponsive surface said radiation of said second wavelength reflected from said imaging web, thereby detecting said color or reflection change without further exposing said imaging web; and

in response to detecting said registration mark, performing an operation on said imaging web.

4,963,460

LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT AND POLYMERIZABLE COMPOUND WITH SILVER HALIDE OUTSIDE AND INSIDE OF MICROCAPSULES

Yutaka Oka, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 31, 1989, Ser. No. 401,604

Claims priority, application Japan, Aug. 31, 1988, 63-218966

Int. Cl.[5] G03C *5/54, 1/02*

U.S. Cl. 430—138 **13 Claims**

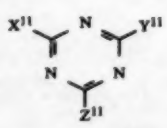
1. A light-sensitive material comprising a support and a light-sensitive layer which contains silver halide, a reducing agent and an ethylenic unsaturated polymerizable compound, said silver halide and polymerizable compound being contained in microcapsules which are dispersed in the light-sensitive layer, wherein the light-sensitive layer further contains silver halide outside of the microcapsules.

4,963,461
LIGHT-SENSITIVE MICROPCAPSULE AND LIGHT-SENSITIVE MATERIAL EMPLOYING THE SAME

Ryuichi Takahashi, and Yoshiharu Yabuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

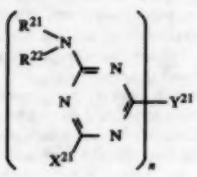
Filed Oct. 3, 1988, Ser. No. 252,462
Claims priority, application Japan, Oct. 2, 1987, 62-249365; Dec. 11, 1987, 62-313486
Int. Cl.[5] G03C *1/72*
U.S. Cl. 430—138 **22 Claims**

1. A light-sensitive microcapsule having a core material which contains a silver halide and an ethylenically unsaturated polymerizable compound, said core material being enclosed in a shell comprising a melamine derivative-aldehyde resin produced from formaldehyde and a melamine compound containing a 2–5 functional melamine derivative of the following formula (I) or a melamine derivative of the following formula (II) in a amount of at least 10 wt.%:



(I)

in which each of X^{11}, Y^{11} and Z^{11} independently is a group selected from the group consisting of an amino group and a substituted amino group of $—NHR^{11}$ or $—NR^{12}R^{13}$ wherein R^{12} and R^{13} which are the same or different from each other, represent a hydrogen atom an alkyl group, an alkoxy group, a phenyl group, a benzyl group, an alkoxycarbonyl group, an alkoxysulfonyl group, a glucoside group, a cyclic lactim group, a nitro group, a pyrrolyl group which is inert to an aldehyde;



(II)

in which each of R^{21} and R^{22} is one atom or one group selected from the group consisting of a hydrogen atom, an alkyl group, an aryl group, a cycloalkyl group and an aralkyl group, provided that one of R^{21} and R^{22} is a hydrogen atom; X^{21} is $—NR^{23}R^{24}$ or $—OR^{25}$ wherein each of R^{23}, R^{24} and R^{25} has the same meaning as that for R^{21}; Y^{21} is an organic linking group such that the number of atoms linking any two sets of the triazine rings is at least four; n is an integer of 2 to 4; and each of the above groups may have one or more substituents.

4,963,462
POSITIVE WORKING, PEEL DEVELOPABLE, COLOR PROOFING SYSTEM HAVING TWO PHOTOSENSITIVE LAYERS

Wojciech A. Wilczak, Jersey City, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jan. 8, 1990, Ser. No. 462,177
Int. Cl.[5] G03C *5/18, 3/02, 11/12*
U.S. Cl. 430—143 **21 Claims**

1. A method for producing a positive image which comprises

(a) providing a photopolymerizable element which comprises:

(i) a strippable, transparent cover; and

(ii) a photopolymerizable composition layer on said cover, which photopolymerizable layer comprises a photoinitiator, a free radical polymerizable component having at least one ethylenically unsaturated group, and an optional organic binding resin, wherein said photoinitiator is present in sufficient amount to initiate the free radical polymerization of said polymerizable component upon exposure to sufficient actinic radiation, and wherein said polymerizable component is present in sufficient amount to provide image differentiation when the composition is imagewise exposed to actinic radiation; and wherein said optional binding resin, when present, is in sufficient amount to bind the composition components into a uniform film, and

(b) providing a photosensitive element which comprises

(i) a support sheet; and

(ii) a photosensitive composition layer directly on said support sheet, which photosensitive layer comprises an organic binder, a light sensitive polymeric diazonium compound or o-quinone diazide compound, and a colorant, wherein said binder is present in sufficient amount to bind the composition components into a uniform film, and wherein said light sensitive compound is present in sufficient amount to provide image differentiation when the photosensitive composition is imagewise exposed to actinic radiation; and wherein said colorant is present in an amount sufficient to uniformly color the layer; and

(iii) an adhesive layer directly adhered to said photosensitive composition layer, which adhesive layer comprises a thermoplastic resin which has a T_g in the range of from about 25° C. to about 100° C.; and

(c) providing a receiver sheet; and

(d) laminating the photosensitive element to the receiver sheet with heat and pressure such that the adhesive layer adheres to the receiver sheet and thereafter removing the support sheet thereby transferring the adhesive layer and photosensitive composition layer to the receiver sheet; and

(e) laminating the photopolymerizable layer to the photosensitive layer at elevated temperature and pressure such that the photopolymerizable composition layer adheres to the photosensitive composition layer; and

(f) then imagewise exposing said photosensitive composition and said photopolymerizable composition through the transparent cover to actinic radiation; and

(g) peeling apart said receiver sheet and said transparent cover thereby forming a positive image on the adhesive layer on said receiver sheet; and

(h) optionally repeating steps (a), (b) and (d) through (g) at least once wherein another photosensitive element according to step (b) having at least one different colorant is transferred via its adhesive layer to the positive image on the receiver sheet produced from the previous photosensitive element and photopolymerizable element.

4,963,463
RADIATION-SENSITIVE RESIN COMPOSITION WITH ADMIXTURES OF O-QUINONE DIAZIDE AND ACID ESTERS HAVING NITROBENZYL OR CYANOBENZYL GROUP

Mitsunobu Koshiba; Keiichi Yamada, both of Yokohama; Yoshiyuki Harita, Kawasaki, all of Japan; Bruno Roland, Haverlee, and Jan Vandendriessche, Haasrode, both of Belgium, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan and UCB Société Anonyme, Brussels, Belgium

Filed Feb. 15, 1989, Ser. No. 310,665
Claims priority, application Japan, Feb. 22, 1988, 63-39334; Aug. 24, 1988, 63-208055
Int. Cl.[5] G03F *7/022*; G03C *1/60*
U.S. Cl. 430—191 **12 Claims**

1. A radiation-sensitive resin composition comprising in admixture a quinonediazide-type radiation-sensitive resin

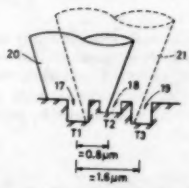
wherein the quinonediazide-type radiation-sensitive resin is at least one member selected from the group consisting of a condensate of a quinonediazide compound with an alkali-soluble resin and a mixture of a quinonediazide compound and an alkali-soluble resin and as a compound generating an acid upon irradiation a member selected from the group consisting of nitrobenzylsulfonic acid esters, cyanobenzylsulfonic acid esters, nitrobenzylcarboxylic acid esters, nitrobenzylphosphoric acid esters, nitrobenzylnitric acid esters and cyanobenzylnitric acid esters; said radiation-sensitive resin and said compound generating an acid being present in an amount effective to provide a photosensitive resist pattern.

4,963,464

OPTICAL MEDIUM HAVING PITS OF DIFFERENT DEPTHS, AND METHOD AND APPARATUS FOR REPRODUCING INFORMATION THEREFROM

Michitaka Setani, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1988, Ser. No. 212,653
Claims priority, application Japan, Jul. 1, 1987, 62-162494
Int. Cl.[5] G03C *1/00*; G11B *5/09*
U.S. Cl. 430—495 **9 Claims**



1. A method of reproducing information by irradiating with a light beam an optical recording medium in which information has been recorded in the form of pits and by detecting a light beam modulated by the pits, comprising the steps of:

providing at least first and second pits removed from the same plane of the medium, the first and second pits independently representing information, the first pit having a first depth and the second pit having a second depth, the first depth differing from the second depth;

irradiating the medium with at least first and second light beams having different wavelengths respectively corresponding to the depths of the first and second pits; and

independently detecting the first and second beams modulated by the first and second pits.

4,963,465

COLOR PHOTOGRAPHIC NEGATIVE RECORDING MATERIAL

Reinhart Matejec; Ralf Büscher, both of Leverkusen, and Hans Langen, Bonn, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 28, 1989, Ser. No. 458,140
Int. Cl.[5] G03C *1/46*
U.S. Cl. 430—506 **5 Claims**

1. A color photographic negative recording material containing at least one red-sensitive, at least one green-sensitive and at least one blue-sensitive silver halide emulsion layer each with assigned color couplers for producing image dyestuffs of complementary color to the spectral sensitivity, at least three part layers of different sensitivity being present for recording light from at least one of the spectral ranges of red, green and blue, that is to say a most sensitive, a medium-sensitive and a least sensitive part layer, at least one of the two more sensitive part layers of which contains a DIR compound, characterized in that the most sensitive and the least sensitive part layer contain a color coupler which couples faster than the color coupler in the medium-sensitive part layer by a factor of at least 1.5.

4,963,466

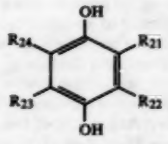
SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL SUITABLE FOR RAPID PROCESSES COMPRISING HYDROQUINONE AND AN ANTIFOGGANT

Makoto Kajiwara; Masanobu Miyoshi; Kaoru Onodera, all of Odawara, and Eiichi Sakamoto, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 325,091, Mar. 15, 1989, abandoned, which is a continuation of Ser. No. 78,870, Jul. 28, 1987, abandoned. This application Jan. 24, 1990, Ser. No. 469,709
Claims priority, application Japan, Jul. 31, 1986, 61-180972
Int. Cl.[5] G03C *7/26, 7/32*
U.S. Cl. 430—551 **14 Claims**

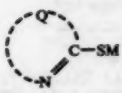
1. A silver halide photographic light-sensitive material comprising a support bearing thereon at least one silver halide emulsion layer containing a dye-forming coupler and a compound represented by the following Formula [I], wherein at least one of said silver halide emulsion layers contains silver halide grains having a silver chloride content of not less than 90 mol % and a compound represented by the following Formula [S];

Formula [I]



wherein, R_{21}, R_{22}, R_{23} and R_{24} are independently selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl group, an alkenyl group, an aryl group, a cycloalkyl group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, an acyl group, an alkylacylamino group, an arylacylamino group, an alkylcarbamoyl group, an arylcarbamoyl group, an alkylsulfonamido group, an arylsulfonamido group, an alkylsulfamoyl group, an arylsulfamoyl group, an alkylsulfonyl group, an arylsulfonyl group, a nitro group, a cyano group, an alkyloxycarbonyl group, an aryloxycarbonyl group, an alkylacyloxy group or an arylacyloxy group, provided that at least one of R_{21} and R_{23} is a group having a total carbon atoms of not less than three);

Formula [S]



wherein Q represents a group of atoms necessary for completing a 1,3,4-oxadiazole ring, a 1,3,4-thiadiazole ring or a 1,3,5-triazine ring; and M represents a hydrogen atom, an alkali metal atom or an ammonium group.

4,963,467

SILVER HALIDE PHOTOGRAPHIC EMULSION

Sadayasu Ishikawa; Masaru Tsukamoto, and Toshihiko Yagi, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 7, 1988, Ser. No. 216,142
Claims priority, application Japan, Jul. 15, 1987, 62-176700
Int. Cl.[5] G03C *1/005*
U.S. Cl. 430—567 **12 Claims**

1. A silver halide photographic emulsion containing core/shell type silver halide grains, said grains comprising a core consisting essentially of silver iodobromide, and at least one shell consisting essentially of silver iodobromide or silver bromide,

said emulsion having an average silver iodide content of less than 7 mol %, said core having a silver iodide content of

not less than 10 mol %, and an outermost shell having an iodide content of not more than 5 mol % wherein,

said grains provide an X-ray diffraction pattern having at least two peaks, corresponding to said core and said outermost shell, respectively, with a diffraction angle 2 θ of between 71° and 74° when a diffraction pattern of a (420) face of said grains is measured using a powder X-ray diffraction method with Kα rays of Cu, and

a ratio of the lowest intensity between said peaks to the highest intensity of the lowest peak of said peaks of 0.7 or less.

4,963,468

IMMUNOSEPARATING STRIP

John D. Olson, Sunnyvale, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 904,597, Sep. 5, 1986. This application Feb. 12, 1987, Ser. No. 13,615

The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.

Int. Cl.[5] G01N *33/535, 33/539, 33/543, 33/558*

U.S. Cl. 435—7 **25 Claims**

1. A method for determining the presence of an analyte, that is capable of binding specifically to an antibody, in a sample suspected of containing said analyte, which comprises

(a) contacting, with a test solution containing said sample, antibodies to said analyte and a conjugate of said analyte and a label, a contact portion of a piece of bibulous material capable of being traversed in at least one direction by said test solution by capillary migration, said bibulous material containing non-diffusively bound to a situs on said bibulous material separated from said contact portion a first receptor capable of binding to said conjugate, the surface area of said situs being less than that of said bibulous material, said bibulous material further containing a second receptor capable of binding said antibodies to said analyte wherein said second receptor is non-diffusively bound to said bibulous material at a portion thereof between said situs and said contact portion,

(b) allowing at least a portion of said test solution to traverse said bibulous material by capillary migration and thereby contact said situs, and

(c) examining said situs for the presence of said conjugate, and relating the presence of said conjugate at said situs to the presence of analyte in the sample.

4,963,469

ENZYMATICALLY INACTIVE, IMMUNOLOGICALLY-ACTIVE β-GALACTOSIDASE MUETIN, PROCESS FOR MAKING AND USES THEREOF

Ralf Mattes, Stuttgart; Helmut Lenz, Tutzing, and Werner Stock, Gräfelfing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jul. 12, 1988, Ser. No. 218,816

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1987, 3724625

Int. Cl.[5] G01N *33/53, 33/563;* C07K *3/00*

U.S. Cl. 435—7 **22 Claims**

10. An immunoassay method for determining an analyte in a liquid sample suspected of containing a potentially interfering binding substance, comprising:

contacting said liquid sample with

(i) a labeled conjugate of (a) enzymatically acitve B-galactosidase and (b) an antibody or bindable fragment thereof which specifically binds to the analyte to be determined, and

(ii) an amount of enzymatically inactive, immunologically active B-galactosidase mutein characterized by an amino acid mutation at amino acid 503 which is normally Tyr, said mutein having no more than 1% of the enzymatic activity of native B-galactosidase and effective to specifically bind any said potentially interfering binding substance capable of binding immunologically active B-galactosidase; and

measuring bound or free labeled conjugate in order to determine the amount of analyte in said sample.

4,963,470

TITANOCENES AND THEIR USE

Bernd Klingert, Inzlingen, Fed. Rep. of Germany; Franciszek Sitek, Therwil, and Manfred Rembold, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 77,280, Jul. 24, 1987, abandoned. This application Jan. 19, 1990, Ser. No. 469,736

Claims priority, application Switzerland, Aug. 1, 1986, 3100/86

Int. Cl.[5] G03C *1/70;* C07F *7/08, 7/18*

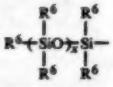
U.S. Cl. 430—281 **23 Claims**

1. A titanocene of formula I

(I)

in which the two radicals R^1 independently of one another are cyclopentadienyl- which is unsubstituted or substituted by C_1–C_{18}-alkyl, C_2–C_{18}-alkenyl, chlorine, phenyl or cyclohexyl, wherein, in this titanocene, at least one radical R^1 is cyclopentadienyl- which is substituted by at least one group of formula Iv or formula V

(IV)

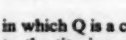


(V)

in which Z is Si, x is 1, 2 or 3, and each radical R^6 independently is linear or branched C_1–C_{18}-alkyl, C_1–C_4-halogenoalkyl, phenyl, C_1–C_{18}-alkoxy or C_1–C_{18}-alkoxy or C_1–C_{18}-alkoxymethyl;

R^2 is a 6-membered carbocyclic or 5- or 6-membered heterocyclic aromatic ring which is substituted by F, CF_3, C_2F_5, CF_2Cl or CF_2CH_3 in at least one of the two ortho-positions relative to the metal-carbon bond, or is furthermore substituted by one or more of the groups halogen, C_1–C_{12}-alkyl; C_1–C_4-alkoxy, C_2–C_{10}-alkoxycarbonyl, aminocarbonyl with up to 12 C atoms, or by a primary, secondary or tertiary amino or aminoalkyl group with up to 20 C atoms or a quaternary ammonium or ammonium alkyl group with up to 30 C atoms; or, when R^2 is an aromatic ring substituted by F, R^2 can be further substituted by at least one polyoxaalkylene radical which is free or etherified or esterified, said radical being bonded to the aromatic ring either directly or via a bridge group; or

R^2 and R^3 together are a radical of formula III



(III)

in which Q is a carboxylic aromatic ring which is bonded to the titanium atom in the 2-position relative to the Y group and is substituted by fluorine in the 3-position, Y is methylene, C_2–C_{12}-alkylidene which is unsubstituted or substituted by phenol; C_5–C_7-cycloalkylidene, or Y is a group —NR^5—, —O—, —S—, —SO—, —SO_2—, —CO—, —SiR_2^4— or —SnR_2^4— where R^5 is hydrogen, C_1–C_{12}-alkyl, cyclohexyl, phenyl, tolyl or benzyl, and the radicals R^4 independently of one another are C_1–C_{12}-alkyl, cyclohexyl, phenyl or benzyl;

R^3 has one of the meanings given for R^2, or R^3 is C_2–C_{12}-alkynyl, phenylalkynyl which has 2–5 C atoms in the alkynyl radical and is unsubstituted or substituted by

halogen or C_1–C_4-alkyl in the phenyl radical; or R^3 is a group $—SiR_3^4$ or $—SnR_3^4$ in which radicals R^4 are as defined above; or R^3 is $—N_3$ or —CN; and when R^2 is an aromatic ring substituted by $—CF_3$, $—C_2F_5$, $—CF_2Cl$ or $—CF_2CH_3$, R^3 may also be halogen, —NCO or —NCS.

17. A composition which is polymerizable by radiation and contains (a) at least one non-volatile monomeric, oligomeric or polymeric compound with at least one polymerizable ethylenically unsaturated double bond and (b) at least one titanocene of the formula I according to claim 1 as the photoinitiator.

23. A liquid photoinitiator mixture containing a titanocene of formula I according to claim 1 and a photoinitiator selected from the group consisting of the benzil ketals, 4-aroyl-1,3-dioxolanes, dialkoxyacetophenones, alpha-hydroxyacetophenones, alpha-aminoacetophenones and mixtures thereof.

4,963,471

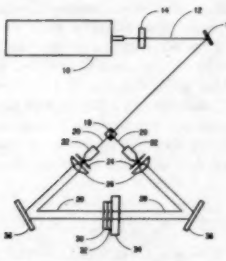
HOLOGRAPHIC PHOTOPOLYMER COMPOSITIONS AND ELEMENTS FOR REFRACTIVE INDEX IMAGING

Torence J. Trout, Yorklyn; Dominic M. Chan, and Bruce M. Monroe, both of Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 14, 1989, Ser. No. 380,840

Int. Cl.[5] G03F *7/027, 7/028, 7/032*

U.S. Cl. 430—282 **75 Claims**



1. A substantially solid, transparent, photopolymerizable composition that forms a refractive-index image upon exposure to actinic radiation as the sole processing step, said composition having a refractive index modulation greater than approximately 0.01 when imaged and consisting essentially of:

(a) approximately 25 to 90% of a solvent soluble, fluorine-containing polymeric binder;

(b) approximately 5 to 60% of a liquid ethylenically unsaturated monomer, said monomer having a boiling point above 100° C. and being capable of addition polymerization;

(c) approximately 0 to 25% of a plasticizer; and

(d) approximately 0.1 to 10% of a photoinitiator system that activates polymerization of said unsaturated monomer upon exposure to actinic radiation;

wherein said percentages are weight percentages of the total composition.

4,963,472

DEVELOPING METHOD FOR PRINTING PLATES FOR WATERLESS OFFSET PRINTING WITH GLYCOL DIETHER CONTAINING DEVELOPER

Hans-Joachim Schlosser, Wiesbaden, and Joerg Strack, Mittelfischbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 11, 1988, Ser. No. 192,701

Claims priority, application Fed. Rep. of Germany, May 12, 1987, 3715792

Int. Cl.[5] G03F *7/021, 7/32*

U.S. Cl. 430—303 **12 Claims**

1. A method for producing waterless offset printing plates, comprising the steps of:

coating a support with a photosensitive layer based on a diazonium salt polycondensation product;

coating said photosensitive layer with a layer of silicone elastomer;

crosslinking said silicone elastomer to produce an unexposed printing plate;

imagewise exposing said unexposed printing plate to radiation; and

developing said exposed plate in a developer consisting essentially of from 50 to 100% by weight of at least one compound of the general formula

$$R—(O—CH_2—CH_2—)_n—O—R$$

wherein

R denotes C_mH_{2m+1},

n denotes an integer form 1 to 25, and

M denotes an integer form 1 to 5.

4,963,473

METHODS OF PROCESSING PRE-SENSITIZED LITHOGRAPHIC PRINTING PLATE AND APPARATUS THEREFOR

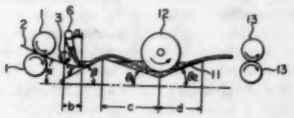
Miegi Nakano, Chofu; Minoru Seino, Hachioji; Masafumi Uehara, Kokubunji, and Akira Nogami, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 53,862, May 26, 1987, abandoned. This application May 1, 1989, Ser. No. 346,279

Claims priority, application Japan, May 27, 1986, 61-121725

Int. Cl.[5] G03F *7/00*

U.S. Cl. 430—309 **5 Claims**



1. A method of processing an imagewise exposed presensitive lithographic printing plate comprising the steps of:

(1) uniformly applying 50 to 500 ml per square meter of said printing plate of developer that has not been substantially used to the surface of said printing plate by a developer supply member composed of two plates and having a slit which contacts the surface of said printing plate at the flexible lowermost portion of said member; (2) transferring said plate containing said developer to a developer storage tank; (3) immersing said plate in said storage tank, and (4) removing said developer from said plate.

4,963,474

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Yoshihiro Fujita; Shinji Ueda; Takatoshi Ishikawa, and Akira Abe, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

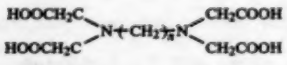
Filed Feb. 13, 1989, Ser. No. 309,588

Claims priority, application Japan, Feb. 13, 1988, 63-31119; Feb. 22, 1988, 63-39003

Int. Cl.[5] G03C 7/42

U.S. Cl. 430—393 20 Claims

1. A method of processing a silver halide color photographic material in which the material is, after color-development, processed in a bath having bleaching ability and then in a bath fixing ability, wherein the bath having bleaching ability has a pH of from 5.0 to 3, wherein a bleaching agent in the bath having bleaching ability is at least one iron (III) complex of an aminopolycarboxyl acid of the following general formula (I) and wherein the bath having fixing ability contains at least one organic phosphonic acid:



(I)

wherein n represents 3, 4 or 5.

4,963,475

METHOD FOR PROCESSING SILVER HALIDE PHOTO-SENSITIVE MATERIAL

Kazuhiro Murai; Keiji Obbayashi, both of Hino, and Kaoru Onodera, Odawara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

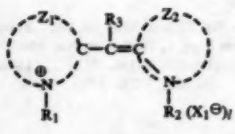
Continuation of Ser. No. 40,487, Apr. 20, 1987, abandoned. This application Mar. 28, 1989, Ser. No. 331,022

Claims priority, application Japan, Apr. 22, 1986, 61-92936

Int. Cl.[5] G03C 5/305

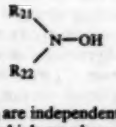
U.S. Cl. 430—467 17 Claims

1. A method of processing light-sensitive silver halide photographic material which comprises processing an imagewise exposed color light-sensitive silver halide photographic material comprising a support and, provided thereon, at least one silver halide emulsion layer containing light-sensitive silver halide grains which are sensitized with a sensitizing dye of general Formula I



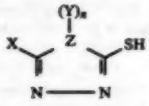
I

wherein Z_1 and Z_2 independently represent a group of atoms necessary to complete a heterocyclic ring consisting of a thiazole, a benzothiazole, a naphthothiazole, a selenazole, a benzoselenazole or a naphthoselenazole, wherein said heterocyclic ring may have a substituent; R_1 and R_2 are independently selected from a group consisting of alkyl, alkenyl, and aryl; R_3 is selected from a group consisting of hydrogen methyl and ethyl; X_1 is an anion and l is 0 or 1; with a color developer solution containing an aromatic primary amine color developing agent in the presence of at least one hydroxylamine derivative of general Formula II or a water soluble salt thereof;



II

wherein R_{21} and R_{22} are independently an alkyl group having 1 to 4 carbon atoms which may have a substituent; and at least one nitrogen containing heterocyclic mercapto compound selected from mercaptotetrazole and compounds of Formula III:



III

wherein X is selected from a group consisting of hydrogen amino, hydroxyl, hydrazino, alkyl, alkenyl, cycloalkyl, aryl, —NHCOR$_1$, —NHSO$_2$R$_1$, and —R$_2$S group; Y is selected from a group consisting of hydrogen, amino, alkyl, alkenyl, cycloalkyl, aryl, —CONHR$_5$, —COR$_4$ group, a —NHCOR$_5$ group or —NHSO$_2$R$_5$ group; Z is nitrogen, sulfur or oxygen; n is 1 when Z is nitrogen and 0 when Z is oxygen or sulfur; and R_1, R_2, R_3, R_4 and R_5 are independently selected from a group consisting of alkyl, alkenyl, cycloalkyl and aryl;

processing for a maximum of 90 seconds with said color developer, and removing developed silver and undeveloped silver halide with a bleaching solution and a fixing solution or with a bleach-fixing solution.

4,963,476

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Tadao Sugimoto, and Masakazu Yoneyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 23, 1988, Ser. No. 248,011

Claims priority, application Japan, Sep. 25, 1987, 62-239033

Int. Cl.[5] G03C 1/12, 1/28

U.S. Cl. 430—574 18 Claims

1. A silver halide photographic material comprising a support having thereon at least one silver halide emulsion layer containing at least 1.0×10^{-4} gram equivalent of an anionic surface active material as anion per gram of a hydrophilic dispersion medium in said emulsion layer, the photographic material having dispersed in said emulsion layer a water-soluble processing-removable light-collecting dye that has an emission band overlapping at least partially with the optical absorption band of a spectral sensitizing dye on a silver halide grain present in said emulsion layer, said light-collecting dye having an emission quantum yield of at least 0.1 determined at a concentration of 10^{-4} mol/dm^3 in a dry gelatin medium at room temperature, with the proviso that the light-collecting dye and the spectral sensitizing dye may be the same compound where the light-collecting dye is partly adsorbed onto silver halide grains.

4,963,477

PROBE CONTAINING A MODIFIED NUCLEIC ACID, RECOGNIZABLE BY SPECIFIC ANTIBODIES AND USE OF THIS PROBE AND THESES SPECIFIC ANTIBODIES TO DETECT AND CHARACTERIZE A HOMOLOGOUS DNA SEQUENCE

Paul Tchen, Nanterre, France, assignor to Institut National de la Sante et de la Researche Medicale, France and Institut Pasteur, France

Continuation of Ser. No. 692,064, Jan. 16, 1985, abandoned. This application Mar. 28, 1989, Ser. No. 330,987

Claims priority, application France, Jan. 16, 1984, 84 00607

Int. Cl.[5] C12Q 1/68

U.S. Cl. 435—6 12 Claims

1. A kit for the detection or isolation of a first predetermined nucleotide sequence, comprising:

a probe containing a second nucleotide sequence which is complementary to said first predetermined nucleotide sequence and which can be hybridized with said first predetermined nucleotide sequence;

said probe further containing a 7-iodo-N-2-acetylaminofluo-

rene group covalently fixed to a base of said second complementary nucleotide sequence; and

first antibodies formed against N-2-(guanosine-8-yl)acetylaminofluorene or against a nucleotide sequence convalently fixed to an N-2-acetylaminofluorene group.

4,963,478

ARTICLE FOR PREFORMING IMMUNOLOGICAL ASSAYS UTILIZING ORGANIC DYES AND METHOD FOR PRODUCING AND UTILIZING SAME

Lyle T. Sinor; Ralph A. Eatz; Darryl L. Stone, all of Roswell, Ga., and Fred V. Plapp, Overland Park, Kans., assignors to Immucor, Inc., Norcross, Ga.

Filed Jul. 5, 1988, Ser. No. 215,041

Int. Cl.[5] G01N *33/543, 33/554*

U.S. Cl. 435—7 **4 Claims**

1. A method for performing a solid-phase immunoassay for the purpose of determining the presence of an immunologically reactive component in a biological fluid by detecting its adherence to its immunological counterpart which is attached to whole cells, said cells being free of contaminating proteins, comprising the steps of:

providing a solid-phase support coated with an organic dye and selected from the group consisting of azo dyes, diazonium salts, tetrazonium salts, tetrazolium salts, triphenylmethanes, xanthenes, acridines, quinolines, thiazoles, indamines, azins, aminoazins, thiazins and phthalocyanins coated thereon;

placing a quantity of said whole cells on said coated support;

immobilizing said whole cells to said organic dye in a manner presenting said whole cells above said organic dye;

contacting said biological fluid to said support for a sufficient period of time to allow said immunologically reactive components in said fluid to bind to said immunological counterpart;

removing any excess fluid from said support; and

assaying for the presence of said immunologically reactive component bound to said immunological counterpart.

4,963,479

REAGENT SYSTEM FOR AN ALPHA-AMYLASE ASSAY CONTAINING AROMATIC SUBSTITUTED GLYCOSIDE

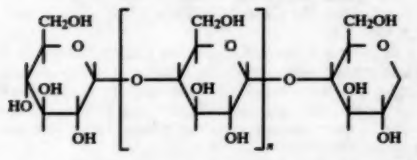
Rodrigo G. Chavez, LaJolla; Harold David, San Diego; Ernest K. Metzner, Del Mar; Gerald F. Sigler, San Diego, and Emily S. Winn-Deen, Poway, all of Calif., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 916,262, Oct. 7, 1986, abandoned. This application Sep. 4, 1987, Ser. No. 91,861

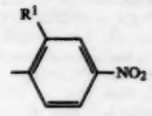
Int. Cl.[5] C12Q *1/40*

U.S. Cl. 435—22 **5 Claims**

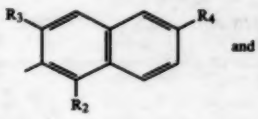
1. A reagent system for an alpha-amylase assay which comprises (a) an aromatic substituted glycoside substrate for the alpha-amylase of the formula,



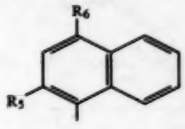
wherein the configuration of the substituent —OR on the anomeric carbon is alpha-, n is an integer of 0 or 1, and R is a substituted aromatic selected from the group consisting of



(a')

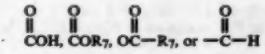


and (b')



(c')

wherein R_1 through R_6 are independently halogen, NO_2, SO_3H,



where R_7 is lower alkyl; (b) a buffer and (c) an effective amount of an enzyme activator selected from the group consisting of hydrazoic acid, an alkali metal azide and an alkaline earth azide.

4,963,480

PROCESS FOR THE PREPARATION OF GAMMA-IRONE

Beatrice Belcour; Didier Courtois, both of Tours, and Charles Ehret, Peymeinade, all of France, assignors to Roure S.A., Argenteuil, France

Filed Jul. 24, 1989, Ser. No. 384,415

Claims priority, application European Pat. Off., Aug. 5, 1988, 88810537

Int. Cl.[5] C12P *39/00, 7/26;* C12R *1/01, 1/38*

U.S. Cl. 435—42 **20 Claims**

1. A process for the preparation of gamma-irone by bioconversion comprising treating an iris rhizome substrate selected from the group consisting of iris rhizomes, iris rhizome parts, iris rhizome extracts, iris rhizome extraction wastes, plant cell cultures of iris rhizomes, and mixtures thereof, with a bacteria selected from the genera group consisting of Enterobacteriacea, Pseudomonacea, and mixtures thereof, in the presence of a plant cell culture medium, and recovering the gamma-irone.

4,963,481

PROMOTER SYSTEM

Jean P. deVilliers, Boston, Mass., assignor to Genetics Institute Inc, Cambridge, Mass.

Continuation-in-part of Ser. No. 810,819, Dec. 18, 1985. This application Nov. 12, 1986, Ser. No. 929,969

Int. Cl.[5] C12P *21/00;* C12N *15/00, 15/11, 15/86*

U.S. Cl. 435—69.1 **5 Claims**

1. A hybrid transcription unit comprising a recombinant DNA molecule or which comprises a nucleotide sequence encoding a heterologous protein operatively linked to the approximately 2.27 kilobase pair PstI restriction fragment of the mCMV genome containing the mouse cytomegalovirus (mCMV) immediate early promoter or to an effective expression promoting fragment thereof functionally linked to a heterologous transcriptional enhancer.

4,963,482

DNA FOR THE REPRESSIBLE AND INDUCIBLE EXPRESSION OF FOREIGN GENES

Angelika Birkmann, Munich, and August Böck, Geltendorf, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 175,780

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710633; Oct. 19, 1987, 3735381

Int. Cl.[5] C12P *21/00*; C12N *15/00*; C07H *21/04*

U.S. Cl. 435—69.1 **25 Claims**

1. Recombinant DNA comprising consensus sequence

```
      T      TTTC   T          A  A    T
   AT   TCG       G   CACGTC   A    AC   G
      G      AAAT   A          G  C    G
```

and a promotor which contains the DNA sequence $GGN_{10}GC$.

4,963,483

METHOD FOR PRODUCING HEPATITIS B VIRUS PROTEINS IN YEAST

Ronald W. Ellis, Overbrook Hills; Arpi Hagopian; Peter J. Kniskern, both of Lansdale, and Donna L. Montgomery, Chalfont, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 13, 1987, Ser. No. 107,812

Int. Cl.[5] C12N *15/00, 5/00*; C12P *21/00*; A61K *39/00*

U.S. Cl. 435—69.3 **13 Claims**

1. A plasmid expression vector containing yeast-derived sequences for the selection and amplification of the plasmid in a species of yeast derived from the families *Saccharomycetaceae* or *Cryptococcaceae*, a yeast promoter, a nontranslated leader having the nucleotide sequence ACAAAACAAA, the preS2+S hepatitis B virus coding region, and a yeast transcriptional termination sequence, the 3' end of the yeast promoter abutting the end of 5' nontranslated leader and the 3' end of nontranslated leader abutting the initiation codon of the preS2+S coding region.

4,963,484

GENETICALLY ENGINEERED POLYPEPTIDES WITH DETERMINANTS OF THE HUMAN DF3 BREAST CARCINOMA-ASSOCIATED ANTIGEN

Donald W. Kufe, Wellesley, Mass., assignor to Dana-Farber Cancer Institute, Inc., Mass.

Filed Jan. 29, 1988, Ser. No. 149,831

Int. Cl.[5] C12D *21/00*; C12N *1/20, 15/00*; C07H *15/12*

U.S. Cl. 435—69.3 **10 Claims**

1. A biologically pure double stranded DNA molecule containing in one strand a first nucleotide sequence that is all or a portion of the sequence

```
CGCACGGCTG  GGGGGGCGGT
.CGTG.....  C...C.....
..........  ..........
..........  G...G.....
..........  ..........
..........

      GGAGCCCGGG          GCCGGCCTGC
      ..........          ..........
      ..........          .........G
      ..........          ..........
      ..........          ..........

            TCTCCGGGGC  CGAGGTGACA   60
            ..........  ..........  120
            .G........  ..........  180
            ..........  ..........  240
```

-continued

```
            ..........  ..........  300
```

(a dot indicating that the nucleotide is identical to the one directly above it in the mode of representation used in this claim) and containing in the other strand a second nucleotide sequence complementary to the first nucleotide sequence said DNA molecule being substantially free of other mammalian DNA said portion coding for a polypeptide capable of reacting with an anti-DF3 antibody.

4,963,485

BRAIN DERIVABLE POLYPEPTIDE FACTORS AND ANTIBODIES THERETO

Mohammed Shoyab, Seattle; Hans Marquardt, Mercer Island, and George J. Todaro, Seattle, all of Wash., assignors to Oncogen

Continuation-in-part of Ser. No. 766,864, Aug. 15, 1985, which is a continuation-in-part of Ser. No. 694,712, Jan. 25, 1985, Pat. No. 4,714,683. This application Jan. 27, 1986, Ser. No. 823,159

Int. Cl.[5] G01N *33/53*; A61K *37/18*

U.S. Cl. 435—7 **48 Claims**

1. A composition of matter substantially free of components from mammalian cells comprising a first polypeptide sequence of at least 15 amino acids and not more than 125 amino acids having at least one epitopic site cross reactive with a second polypeptide found in mammalian brain capable of specifically binding to the diazepam receptor in vitro, said first polypeptide including an amino acid sequence comprising one or more of the following peptide sequences:

a. Y aa^a aa^a Y K Q A T aa^b

b. K W D A W

c. A M aa^c A Y $(X)_x$ V E E

d. T K P aa^d aa^b E E M L F I Y aa^c H Y K

e. K G T S K E D A

wherein:

aa^a is an aromatic amino acid;

aa^b and aa^c are any amino acids;

aa^d and aa^e are aliphatic neutral amino acids;

aa^b is an aliphatic amino acids;

x is from 1 to 3 amino acids; and

x is 0 or 1.

10. Antibodies capable of binding to a composition according to claim 1 and prepared in response to a composition according to claim 1 or an immunogenic fragment thereof.

12. A method for detecting the presence of a polypeptide found in mammalian brains of rom about 7,000 to 15,000 molecular weight and capable of preferentially binding to the diazepam receptor, which comprises:

combining antibodies according to claim 10 with a sample suspected to containing said polypeptide and determining the presence of complex formation with said antibodies.

4,963,486

DIRECT FERMENTATION OF CORN TO L(+)-LACTIC ACID BY *RHIZOPUS ORYZAE*

Yong D. Hang, Geneva, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Apr. 21, 1989, Ser. No. 342,207

Int. Cl.[5] C12P *7/56*; C12R *1/845*

U.S. Cl. 435—139 **7 Claims**

1. A single-step fermentation process for producing L(+)-lactic acid in high yield without the addition of starch-to-sugar converting enzyme substantially from a plant starch, serial grass or kernel renewable biomass selected from the group consisting of corn cassava, rice, oat, wheat, barley and sorghum which comprises:

(a) heating the finely divided biomass with water at a temperature of from about 60° C. to about 124° C. for a time sufficient to sterilize the said biomass and to form a gelatinous medium;

(b) inoculating the gelatinous medium with viable spores of L(+)-lactic acid producing *Rhizopus oryzae* and fermenting the medium at a temperature from about 20° C. to about 40° C;

(c) adding sterile neutralizing material to the medium after about 24 hours incubation to maintain the pH of the medium in the range of from about 4.0 to about 7.2;

(d) further incubating to produce (L(+)-lactic acid or salt thereof in high yield; and

(e) isolating the L(+)-lactic acid wherein the said process is conducted on the substantial absence of extraneous nutrients or minerals.

4,963,487

METHOD FOR DELETION OF A GENE FROM A BACTERIA

Paul R. Schimmel, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 688,612, Jan. 3, 1985, Pat. No. 4,713,337, and a continuation-in-part of Ser. No. 833,920, Feb. 26, 1986, Pat. No. 4,774,180. This application Sep. 14, 1987, Ser. No. 96,958

The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.

Int. Cl.[5] C12N *15/00, 7/00;* C07H *15/12*

U.S. Cl. 435—172.3 10 Claims

1. A method for deletion of a gene from a bacteria comprising:

(a) constructing a linear DNA fragment wherein the fragment has sequences sufficiently homologous to regions on the cell chromosome flanking the gene to be deleted; to permit base pairing therebetween

(b) placing a second gene whose expression results in a rapidly detectable phenotype between the hybridizing sequences in the DNA fragment;

(c) introducing the linear DNA fragment into bacterial cells;

(d) selecting for a double reciprocal recombination mediated by the RecA gene by culturing the cells containing the linear DNA under conditions wherein the phenotype encoded by the second nucleotide sequence is detected and cells with a double reciprocal recombination express the detectable phenotype; and

(e) altering the cell strain phenotype from recA+ to reca— immediately after the linear DNA fragment is incorporated into the cell chromosome by introduction of a second linear DNA fragment containing sequences homologous to regions flanking the recA gene.

4,963,488

DNA SEQUENCES, RECOMBINANT DNA MOLECULES AND PROCESS FOR THE PREPARATION OF THE ENZYME MUTAROTASE FROM ACINETOBACTER CALCOACETICUS

Christiane Gatz, Marl; Joachim Altschmied, Munich; Hans G. Gassen, Darmstadt, and Wolfgang Hillen, Erlangen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 903,319, Sep. 3, 1986, abandoned. This application Sep. 13, 1989, Ser. No. 406,888

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1985, 3531360

Int. Cl.[5] C12N *9/90, 2/21, 15/52, 15/70*

U.S. Cl. 435—233 17 Claims

1. An isolated DNA molecular consisting essentially of a DNA sequence derived from the genome of a microorganism of the genus Acinetobacter and coding for a polypeptide having the biological activity of the enzyme mutarotase, wherein, when said DNA molecular is expressed in *E. coli*, the resultant protein is secreted into the medium in which said *E. coli* is grown in amounts substantially greater than when said DNA molecular is expressed in the Acinetobacter from which it is derived.

4,963,489

THREE-DIMENSIONAL CELL AND TISSUE CULTURE SYSTEM

Gail K. Naughton, and Brian A. Naughton, both of Groton, Vt., assignors to Marrow-Tech, Inc., La Jolla, Calif.

Continuation-in-part of Ser. No. 38,110, Apr. 14, 1987, which is a continuation-in-part of Ser. No. 36,154, Apr. 3, 1987, Pat. No. 4,721,096, which is a continuation of Ser. No. 853,569, Apr. 18, 1986, abandoned. This application Sep. 8, 1988, Ser. No. 242,096

Int. Cl.[5] C12N *5/00;* A01N *1/02*

U.S. Cl. 435—240.1 10 Claims

1. A living stromal tissue prepared in vitro, comprising stromal cells and connective tissue proteins naturally secreted by the stromal cells attached to and substantially enveloping a framework composed of a biocompatible, non-living material formed into a three dimensional structure having interstitial spaces bridged by the stromal cells.

4,963,490

POROUS INORGANIC MEMBRANE SUPPORT AND METHOD

Stephen J. Churchouse, and Elizabeth M. Seamans, both of Banbury, England, assignors to Alcan International Limited, Montreal, Canada

Filed Sep. 1, 1988, Ser. No. 239,502

Claims priority, application United Kingdom, Sep. 7, 1987, 8721018

Int. Cl.[5] C12N *5/00;* C12M *3/00*

U.S. Cl. 435—240.241 10 Claims

1. A method of growing or maintaining cells by means of a porous inorganic support, which comprises applying a culture of the cells to a surface of a porous inorganic membrane support and maintaining the cells under conditions to cause them to grow or be maintained on the support.

9. Apparatus for growing cells comprising a porous inorganic membrane support (32) having a first face in contact with a first liquid medium (40) and a second face to which the growing cells (44) adhere in contact with a second liquid medium (42), wherein the first liquid medium is not in communication with the second liquid medium except through the porous support.

4,963,491

PROCESS OF REMOVING BIOLOGICAL CONTAMINANTS WITH ENZYMES FROM KRILL

Lars G. I. Hellgren, Västra Frölunda, S-421 63 Vst Frölunda, Sweden; Viggo Mohr, St. Jorgensveita 6a, N-7000 Trondheim, Norway, and Jan G. Vincent, Linnegatan 31, S-114 47 Stockholm, all of Sweden

Division of Ser. No. 82,134, Jun. 8, 1987, Pat. No. 4,801,451, which is a continuation of Ser. No. 621,911, Jun. 18, 1984, abandoned. This application Jan. 27, 1989, Ser. No. 302,190

Claims priority, application Sweden, Oct. 25, 1982, 8206022; Apr. 22, 1983, 83022681

The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.

Int. Cl.[5] D06M *16/00;* C12N *9/64, 9/50, 9/48*

U.S. Cl. 435—264 8 Claims

1. In a cleaning process for removing biological contaminants by the application of enzymes to the contaminants; wherein the improvement comprises the application of a biological contaminant removing effective amount of enzymes comprising a mixture of exo- and end-peptidases isolated from krill of the order Euphausiaceae.

4,963,492

METHOD FOR THE ENZYMATIC RACEMATE RESOLUTION OF RACEMIC ALCOHOLS WITH/IN VINYL ESTERS BY TRANSESTERIFICATION

Reinhold Keller, Bad Soden am Taunus; Wolfgang Holla, Hofheim am Taunus, and Gerd Fülling, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

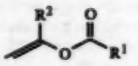
Filed Dec. 21, 1988, Ser. No. 287,371

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743824

Int. Cl.[5] C12P 7/02

U.S. Cl. 435—280 **8 Claims**

1. A method for the enzymatic racemate resolution of a racemic alcohol, which comprises a vinyl ester of the formula I



I

in which

R^1 denotes C_1–C_{18}-alkyl which is unsubstituted or halogen-substituted, phenyl or C_1–C_3-alkoxy-C_1–C_4-alkyl, and

R^2 denotes hydrogen or methyl,

being reacted, in the presence of a lipase from pig liver, pig pancreas or from a microorganism selected from Candida, Mucor, Rhizopus, Penicillium, Aspergillus and Pseudomonas, with a racemic alcohol of the formula II

II

in which

R^3 denotes C_1–C_{18}-alkyl or C_3–C_{10}-cycloalkyl, each being unsubstituted or halogen-substituted,

and

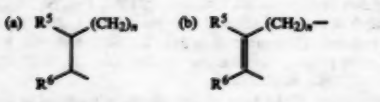
R^4 denotes epoxy-C_1–C_5-alkyl, the epoxy group being in the β-position with respect to the OH group in the radical of the formula II,

or

R^4 denotes C_1–C_{10}-alkyl, C_2–C_{10}-alkenyl, C_2–C_{10}-alkynyl, C_3–C_8-cycloalkenyl, where the alkyl, alkenyl, alkynyl and cycloalkenyl radicals are unsubstituted or substituted by COOH, halogen, NO_2, CN, C_1–C_4-alkoxycarbonyl or phenyl, where the phenyl radical in turn is unsubstituted or substituted by halogen, NO_2, CN or C_1–C_4-alkoxy, or R^4 denotes aryl or heteroaryl, where the aryl or heteroaryl radicals are unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, NO_2, CN or N Pg, where Pg represents an amino protective group,

or in which

R^3 and R^4 together represent an alkenylene radical of the formula III (a) or (b)



III

n is 1, 2 or 3, and

R^5 and R^6 are identical or different and denote hydrogen, C_2–C_4-alkenyl or C_1–C_4-alkyl, or

R^5 and R^6 together denote fused-on phenyl or fused-on naphthyl, where the phenyl or naphthyl radical is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, NO_2, CN or halogen,

and where the alkenylene radical of the formula III can also have a keto group,

and subsequently isolating the resulting optically pure racemic alcohol of the formula II.

4,963,493

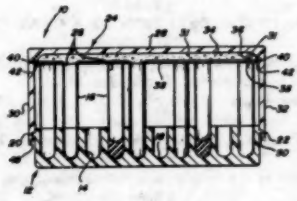
EXTRACTION RACK

Athanasios C. Daftsios, 866 Waterman Rd., Ann Arbor, Mich. 48103

Filed Oct. 16, 1989, Ser. No. 421,745

Int. Cl.[5] C12M 1/00

U.S. Cl. 435—287 **14 Claims**



1. An extraction rack cover comprising: sealing surface means for engaging the open ends of a plurality of tubes supported in a rack in an upright position; arm means extending from said sealing surface means; and locking means for locking said arm means to the rack while applying a force on said sealing surface means perfecting a sealing engagement against the open ends of the tubes.

4,963,494

ENZYME IMMOBILIZATION IN AN ANISOTROPIC ULTRAFILTRATION MEMBRANE

Ken Hibino; Takeshi Okada; Kazuo Nakao, and Yuko Sahashi, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 917,114, Oct. 8, 1986, abandoned. This application Mar. 6, 1989, Ser. No. 319,857

Claims priority, application Japan, Oct. 8, 1985, 60-225435

Int. Cl.[5] C12M 1/40; C12N 11/08, 11/06, 11/04

U.S. Cl. 435—288 **11 Claims**

1. An enzyme immobilized membrane comprising an anisotropic ultrafiltration polysulfone membrane including a dense layer having a molecular cut off from 1,000 to 1,000,000 and a porous layer, the porous layer having retained therein a water-soluble polymer with at least two functional groups in a cross-linked state, and an enzyme being covalently bonded to the functional groups whereby the enzyme is immobilized within the porous layer. wherein said water-soluble polymer is selected from the group consisting of a polyalkyleneimine, a polyaklylene glycol, and a polyallylamine.

4,963,495

SECRETION OF HETEROLOGOUS PROTEINS

Chung N. Chang, San Mateo; Gregory L. Gray, San Francisco; Herbert L. Heyneker, Burlingame, and Michael W. Rey, San Mateo, all of Japan, assignors to Genentech, Inc., San Francisco, Calif.

Filed Oct. 5, 1984, Ser. No. 658,342

Int. Cl.[5] C10P 21/00; C12N 12/00

U.S. Cl. 435—320 **4 Claims**

1. A DNA sequence encoding a protein having the sequence of mature hGH, operably linked, at the DNA region encoding the amino terminus of hGH, to a DNA sequence encoding the STII signal.

4,963,496

COLOR MARKER IN STREPTOMYCETES PLASMIDS

Günter Muth; Wolfgang Wohlleben; Alfred Pühler, all of Bielefeld; Gerhard Wöhner, Flörsheim am Main, and Rüdiger Marquardt, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 11, 1987, Ser. No. 83,806

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1986, 3627405

Int. Cl.[5] C12N *15/00, 1/20;* C12P *21/00*

U.S. Cl. 435—320 6 Claims

1. A recombinant DNA comprising a gene coding for a blue coloring agent in Streptomyces, obtainable from the total DNA of *Streptomyces coelicolor* DSM 3030 by cutting with BamHI, cloning a fragment about 5.5 kb in size, and selecting for production of a blue coloring agent.

4,963,497

ISOLATION AND PURIFICATION OF THE EIGHTH GENE OF HTLV-III

Flossie Wong-Staal, Rockville, Md.; Pranab K. Chanda, Paoli, and John Ghrayeb, Thorndale, both of Pa., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Oct. 20, 1986, Ser. No. 920,780

Int. Cl.[5] C12N *15/00;* C07H *15/12*

U.S. Cl. 435—320 2 Claims

1. R gene of HTLV-IIIB as shown in FIG. 1A.

4,963,498

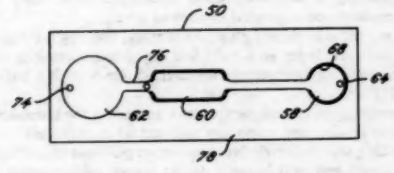
CAPILLARY FLOW DEVICE

Robert S. Hillman, Cupertino; Michael E. Cobb, Sunnyvale; Jimmy D. Allen, Los Altos; Ian Gibbons, Menlo Park; Vladimir E. Ostoich, San Jose, and Laura J. Winfrey, Belmont, all of Calif., assignors to Biotrack, Mountain View, Calif.

Division of Ser. No. 880,793, Jul. 1, 1986, Pat. No. 4,756,884, which is a continuation-in-part of Ser. No. 762,748, Aug. 5, 1985, abandoned. This application Jan. 15, 1988, Ser. No. 144,416

Int. Cl.[5] G01N *31/22, 33/52*

U.S. Cl. 436—69 18 Claims



1. A method for determining the presence of amount of an analyte in, or a property of, a fluid sample, comprising:

applying said sample to device comprising an entry port for said sample, a vent, a capillary pathway connecting said entry port to said vent, and a reagent in said capillary pathway, wherein said sample flows through said capillary pathway under the sum of gravitational and capillary forces and interaction of said reagent with said sample modifies a characteristic of said sample associated with said flow;

allowing said sample to interact with said reagent and traverse at least a portion of said capillary pathway;

detecting said flow characteristic; and

relating said flow characteristic to the presence or amount of said analyte in, or to said property of, said fluid sample.

4,963,499

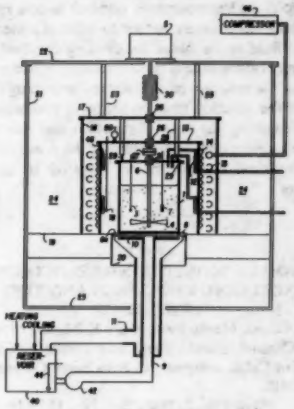
METHOD FOR THE CALORIMETRY OF CHEMICAL PROCESSES

Gerald W. Stockton, Morrisville; Dale H. Chidester, Levittown, both of Pa., and Susan J. Ehrlich, Hamilton Township, Mercer County, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 517,189, Jul. 25, 1983, Pat. No. 4,892,707. This application Feb. 24, 1989, Ser. No. 315,363

Int. Cl.[5] G01N *25/20*

U.S. Cl. 436—147 2 Claims



1. A method of operating a calorimeter for use in examining chemical processes in a reaction mass said calorimeter comprising:

(a) a flat bottomed reaction vessel for containing a reaction mass;

(b) a gas-tight cover for said reaction vessel having at least two chemical inlet ports;

(c) an agitator mechanism disposed within said reaction vessel;

(d) a first temperature sensor disposed within said reaction vessel;

(e) a calibration heater disposed within said reaction vessel;

(f) a pressure relief mechanism for relieving overpressure in said reaction vessel;

(g) a heat exchanger in intimate thermal contact with the base of said reaction vessel for regulating heat flow to the vessel and the reaction mass disposed therein, said heat exchanger comprising an electric heater attached to a circular metal plate and means for circulating a fluid from a fluid reservoir at a defined temperature for cooling said metal plate; said temperature regulation means regulating said heat exchanger through control of said electric heater;

(h) an adiabatic shield surrounding said reaction vessel, to prevent uncontrolled heat leakage from said vessel, said adiabatic shield comprising a closed barrier vessel having a cover;

(i) means for heating said adiabatic shield;

(j) means for cooling said adiabatic shield;

(k) a second temperature sensor disposed in the space between said adiabatic shield and said reaction vessel;

(l) means for supplying chemical feed streams to said chemical inlet ports;

(m) means to equilibrate the temperature of said chemical feed streams;

(n) means for driving said agitator mechanism located external to said reaction vessel, including a drive shaft passing through said cover of said adiabatic shield and said gas-tight cover of said reaction vessel;

(o) a gear-toothed coupler in said shaft between said reaction

vessel cover and adiabatic heat shield cover to permit ease of access to said reaction vessel; and

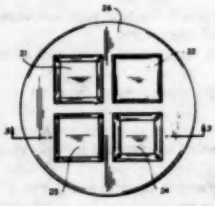
(p) temperature regulation means receiving inputs from said first and second temperature sensors and providing outputs to said calibration heater, said heat exchanger, and said means for heating said adiabatic heat shield; the method which comprises maintaining the temperature difference between the fluid reservoir and chemical reaction mass constant by the heat exchanger working in concert with said means for circulating the fluid from the fluid reservoir and a third temperature sensor in said reservoir, said temperature control means responsive to said third temperature sensor to control a means for heating the fluid and a means for cooling the fluid to maintain the temperature of said fluid constant; holding the temperature of the reaction mass constant or forcing the temperature of the reaction mass to follow a prescribed variation and measuring the heat of reaction and reaction kinetics by the proportional adjustment of the power dissipation in the electrical control heater located in said heat exchanger.

4,963,500

METHOD OF MONITORING SEMICONDUCTOR MANUFACTURING PROCESSES AND TEST SAMPLE THEREFOR

George W. Cogar, Menlo Park; Gary E. Miner, Mountain View; Lee A. Christel, Menlo Park, and James F. Gibbons, Palo Alto, all of Calif., assignors to Sera Solar Corporation, Santa Clara, Calif.

Filed Feb. 2, 1988, Ser. No. 151,436
Int. Cl.[5] H01L *21/66*
U.S. Cl. 437—8 2 Claims



1. The method determining contaminants in semiconductor processes which comprise forming in a wafer of high purity/high carrier lifetime semiconductor material of predetermined thickness at least one region of a thickness which is less than the said predetermined thickness to provide a test wafer, subjecting the high purity/high carrier lifetime test wafer to the semiconductor process and thereafter determining degradation of the lifetime of carriers in said region of said test wafer as a result of said process.

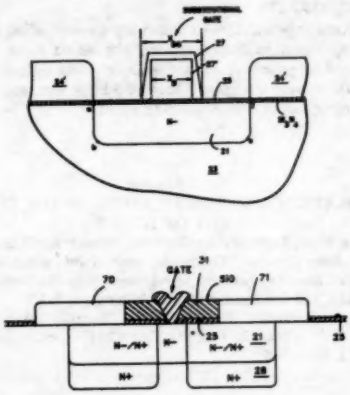
2. The method of determining contaminants in semiconductor processing which comprise the steps of forming in a wafer of high purity/high carrier lifetime semiconductor material of predetermined thickness a plurality of regions of different thicknesses, each of said plurality of regions having a thickness less than the predetermined thickness, measuring the carrier lifetime in each of said regions of different thicknesses, subjecting the wafer to the processing and thereafter again measuring the lifetime in each of said regions and determining the extent of degradation of the surface and bulk carrier lifetime.

4,963,501

METHOD OF FABRICATING SEMICONDUCTOR DEVICES WITH SUB-MICRON LINEWIDTHS

Frank J. Ryan, Agoura; James W. Penney, Thousand Oaks, and Aditya K. Gupta, Newbury Park, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 25, 1989, Ser. No. 412,253
Int. Cl.[5] H01L *21/338*
U.S. Cl. 437—40 20 Claims



1. A method of fabricating a semiconductor device, comprising the steps of:

implanting a first dose of ions into a selected region of a semiconductor substrate to form a lightly doped layer;

positioning a photoresist mask over said substrate to form masked and unmasked areas;

implanting a second dose of ions into said selected region to form a heavily doped layer below said unmasked areas while retaining said lightly doped layer below said masked areas;

reducing a basewidth of said photoresist mask to a range of approximately 1.0 to 0.1 micron by oxygen plasma etching, thereby forming expanded unmasked areas;

depositing a nonconforming dielectric layer atop said masked and expanded unmasked areas;

lifting off said etched photoresist mask, thereby leaving said dielectric layer atop only said expanded unmasked areas;

removing any remaining dielectric dogears with a buffered HF dip;

depositing an anneal encapsulant, annealing the semiconductor device, and removing said anneal encapsulant;

etching said dielectric layer to expose portions of said lightly doped and said heavily doped layers, said exposed portions of said lightly doped layer having a dimension in the range of approximately 1.0 to 0.1 micron; and

depositing metallization layers to contact said exposed lightly doped and heavily doped layers, respectively.

4,963,502

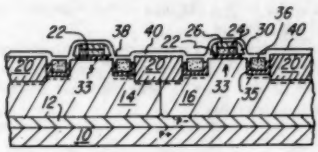
METHOD OF MAKING OXIDE-ISOLATED SOURCE/DRAIN TRANSISTOR

Clarence W. Teng, Plano; Thomas E. Tang, Dallas, and Che-Chia Wei, Plano, all of Tex., assignors to Texas Instruments, Incorporated, Dallas, Tex.

Division of Ser. No. 238,978, Aug. 25, 1988. This application Oct. 3, 1989, Ser. No. 416,566
Int. Cl.[5] H01L *21/336*
U.S. Cl. 437—41 7 Claims

1. A process for fabricating integrated circuits, comprising the steps of:

(a) providing a substrate having a monocrystalline upper portion:
(b) providing field isolation regions in predetermined locations in monocrystalline upper portion to define active device locations therebetween:
(c) forming insulated gate lines over predetermined locations including predetermined portions of said active device areas, said insulated gate lines defining transistor channels in portions of said active device areas:
(d) forming sidewall filaments on said gate lines:
(e) etching, to approximately a predetermined depth, areas of said monocrystalline upper portion of said silicon that are not covered by said gate lines, by said field isolation, nor by said sidewall filaments on said gate lines, to form a source/drain-contact recess:



(f) forming a dielectric conformally on bottoms and sidewalls of said recess:
(g) filling said source/drain-contact recesses with a conductive material:
(h) etching back said conformally formed dielectric from around said source/drain-contact recesses to produce a groove surrounding the surface of said source/drain-contact recesses, and refilling said groove with a filament of conductive material; and
(i) heating said substrate to cause outdiffusion of dopants from said isolated source/drain-contact regions, to create a plurality of source/drain diffusions connecting said source/drain contact regions to corresponding ones of said transistor channel regions.

4,963,503

METHOD OF MANUFACTURING LIQUID CRYSTAL DISPLAY DEVICE

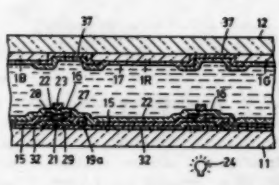
Shigeo Aoki, Hachikno; Yasuhiro Ugai, Yao; Katsumi Miyake, Nara, and Kotaro Okamoto, Hino, all of Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan

Division of Ser. No. 300,688, Jan. 18, 1989, Continuation of Ser. No. 812,885, Dec. 4, 1985, abandoned. This application Mar. 29, 1989, Ser. No. 330,254

Claims priority, application Japan, Apr. 9, 1984, 59-70440

Int. Cl.[5] H01L *21/88, 21/265*

U.S. Cl. 437—41 **2 Claims**



1. A method of manufacturing a liquid crystal display device by forming a plurality of display electrodes and thin film transistors connected thereto on one surface of a first transparent substrate, forming a transparent common electrode on one surface of a second transparent substrate, and sealing a liquid crystal between said first and second transparent substrates with said display electrodes and common electrode on the inner side,

said display electrodes and thin film transistors being formed by steps comprising the following steps in the order stated:

(1) forming opaque metal layers together with source buses of the same material as said opaque metal layers on areas of said first transparent substrate where said thin film transistors are to be formed;
(2) forming an insulating film on said opaque metal layer and source buses;
(3) forming holes in portions of said insulating film where source electrodes are to be formed;
(4) forming a plurality of display electrodes and source electrodes of a transparent conductive material of ITO adjacent to but spaced from each other on said insulating film, said source electrodes being connected to said source buses through said holes, a marginal edge of each said display electrode opposite a corresponding one of said source electrodes defining a drain electrode;
(5) forming an amorphous semiconductor layer extending between each source electrode and a corresponding drain electrode such that marginal edges of said amorphous semiconductor layer overlie said source and drain electrodes, respectively;
(6) forming a gate insulating film on said amorphous semiconductor layers;
(7) forming metal gate electrodes on said gate insulating film such that each said metal gate electrode extends between each said drain electrode and the corresponding source electrode while leaving a pair of gaps defined respectively between the opposite ends of said metal gate electrode and edges of said source and drain electrodes when viewed in a direction perpendicular to said first transparent substrate;
(8) implanting ions into each said amorphous semiconductor layer using each said metal gate electrode as a mask, thereby to render portions of said amorphous semiconductor layer outside said metal gate electrode into ohmic contact layers; and
(9) using a laser to anneal each said amorphous semiconductor layer with each said metal gate electrode being used as a mask.

4,963,504

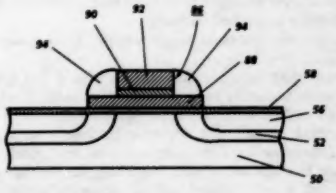
METHOD FOR FABRICATING DOUBLE IMPLANTED LDD TRANSISTOR SELF-ALIGNED WITH GATE

Tiao-Yuan Huang, Cupertino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 123,693, Nov. 23, 1987, Pat. No. 4,907,048. This application Nov. 24, 1989, Ser. No. 428,155

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—44 **15 Claims**



1. A method for fabricating LDD transistor devices comprising the steps of:

providing a semiconductor substrate of a first conductivity type,

forming a gate insulating film on said semiconductor substrate,

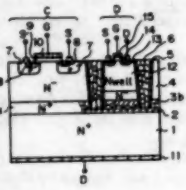
forming a thin conductive layer upon said gate insulating film,
forming a thick alignment member upon said thin conductive layer,
doping said substrate to a first impurity concentration through said thin conductive layer, in alignment with said thick alignment member, with an impurity having a conductivity type opposite to that of said semiconductor substrate, so as to form a first doped region,
depositing sidewall spacers upon said thin conductive layer on either side of said thick alignment member,
doping said substrate to a second impurity concentration, higher than said first impurity concentration, in alignment with said sidewall spacers, with an impurity having a conductivity type opposite to that of said semiconductor substrate, so as to form a second doped region
removing portions of said thin conductive layer outboard of said sidewall spacers, and
thermally treating the substrate for electrically activating said impurities.

4,963,505

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING SAME

Tetsuo Fujii, Toyohashi; Susumu Kuroyanagi, Anjo, and Yukio Tsuzuki, Nukata, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 21, 1988, Ser. No. 260,997
Claims priority, application Japan, Oct. 27, 1987, 62-271109; Nov. 30, 1987, 62-304340
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—62 **9 Claims**



1. A method of making a semiconductor device, which comprises the following steps:
(a) forming an insulating film at a predetermined region of a main surface of a first single crystal semiconductor substrate,
(b) forming a polycrystalline semiconductor layer on said insulating film, and further, forming an electrically conductive semiconductor layer on a main surface of said first single crystal semiconductor substrate on which said insulating film is not formed,
(c) smoothing said surface of said polycrystalline semiconductor layer and said surface of said semiconductor layer to form a smoothed surface,
(d) preparing a second single crystal semiconductor substrate,
(e) connecting the smoothed surface of said first single crystal semiconductor layer to a main surface of said second single crystal semiconductor substrate,
(f) forming an isolation region extending from a top main surface of said second single crystal semiconductor substrate to a surface of said insulating film so that a portion in said second single crystal semiconductor substrate surrounded by said isolation region and mounted on said insulating film is electrically isolated from another portion thereof, and
(g) forming a semiconductor element on said region mounted on said insulating film and isolated from said other portion by said isolation region, and forming a semiconductor element used for electric power, an electric current path thereof being formed from said second single crystal semiconductor substrate to said first single crystal semiconductor substrate, through said semiconductor layer, on a portion other than said portion isolated by said isolation region.

4,963,506

SELECTIVE DEPOSITION OF AMORPHOUS AND POLYCRYSTALLINE SILICON

Hang M. Liaw, and Christian A. Seelbach, both of Scottsdale, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Apr. 24, 1989, Ser. No. 342,004
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—101 **20 Claims**

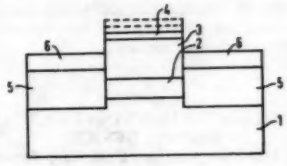
1. A method for selectively depositing amorphous or polycrystalline silicon comprising the steps of:
placing a wafer having exposed silicon regions thereon into a CVD reactor; and
subjecting said wafer to gas mixture consisting essentially of a silicon containing gas and a halogen containing gas, at least one of said gases flowing into said reactor with a hydrogen carrier gas.

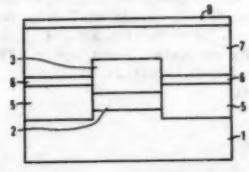
4,963,507

METHOD AND MANUFACTURING A LASER DIODE WITH BURIED ACTIVE LAYER

Markus-Christian Amann; Wolfgang Thulke, both of Munich, and Gerhard Baumann, Ottobrunn, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 27, 1988, Ser. No. 186,799
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714522
Int. Cl.[5] H01L *21/20, 21/208*
U.S. Cl. 437—130 **15 Claims**





1. A method for manufacturing a laser diode with buried active layer and with metal contacts on the opposite sides of the layer format, proceeding on the basis of a double heterolayer structure that contains at least one substrate of a first semiconductor material, an active layer of a second semiconductor material that has a higher refractive index and a smaller energy band gap than the first semiconductor material, and contains an upper layer of the first semiconductor material, comprising the following steps: (a) applying a cover layer of a third semiconductor material that will dissolve in super-cooled melts of the first semiconductor material on the double heterolayer structure on the upper layer; (b) defining a stripe by

laterally etching the cover layer, the upper layer, and the active layer off down into the substrate; and (c) applying, by liquid phase epitaxy, a plurality of layers of the first semiconductor material at the side of the stripe at least up to the height of the stripe, causing the cover layer to dissolve.

4,963,508

METHOD OF MAKING AN EPITAXIAL GALLIUM ARSENIDE SEMICONDUCTOR WAFER USING A STRAINED LAYER SUPERLATTICE

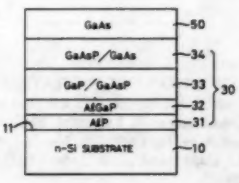
Masayoshi Umeno; Shiro Sakai, both of Nagoya, and Shinichiro Yahagi, Ohbu, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha and Nagoya Institute of Technology, both of Nagoya, Japan

Division of Ser. No. 325,115, Mar. 20, 1989, Pat. No. 4,928,154, and a continuation of Ser. No. 903,195, Sep. 3, 1986, abandoned. This application Feb. 22, 1990, Ser. No. 483,364

Claims priority, application Japan, Sep. 3, 1985, 60-195628; Sep. 3, 1985, 60-195629; Sep. 3, 1985, 60-195630; Sep. 4, 1985, 60-195435

Int. Cl.[5] H01L *21/20*

U.S. Cl. 437—132 **3 Claims**



1. A method of producing a semiconductor wafer having an epitaxial GaAs layer, comprising the steps of:

preparting a monocrystalline Si substrate having a major surface which is inclined at an off angle between 0.5° and 5° with respect to (100);

forming at least one intermediate layer by epitaxy on said major surface of said monocrystalline Si substrate, as a buffer layer for accommodating a lattice mismatch between said Si substrate and said GaAs layer;

said at least one intermediate layer consisting essentially of GaP layer formed on said Si substrate, a GaP/GaAsP superlattice formed on said GAP layer, and a GaAsP-/GaAs superlattice on said GaP/GaAsP superlattice, wherein said GaP layer has a greater thickness than the total thickness of said superlattices; and

said GaP/GaAsP superlattice and said GaAsP/GaAs superlattice having an average lattice constant between the lattice constant of said Si substrate and the lattice constant of said GaAs layer; and forming said epitaxial GaAs layer on said said GaP/GaAsP superlattice.

4,963,509

GOLD DIFFUSION METHOD FOR SEMICONDUCTOR DEVICES OF HIGH SWITCHING SPEED

Yutaka Yoshizawa, Sakado, and Akira Uemura, Saitama, both of Japan, assignors to Sanken Electric Co., Ltd., Saitama, Japan

Filed Dec. 12, 1989, Ser. No. 450,223

Claims priority, application Japan, Dec. 16, 1988, 63-317711

Int. Cl.[5] H01L *21/225*

U.S. Cl. 437—142 **8 Claims**

1. In the fabrication of a semiconductor device capable of high-speed switching operation, a method of gold diffusion which comprises:

(a) providing a semiconductor substrate having a pair of opposite main faces;

(b) forming a layer of gold on one of the main faces of the semiconductor substrate;

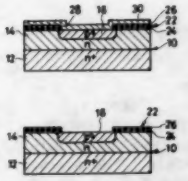
(c) causing the diffusion of gold from the gold layer into the semiconductor substrate by heating the semiconductor substrate to a first predetermined temperature;

(d) removing the remaining gold layer from the semiconductor substrate; and

(e) activating the diffused gold by heating the semiconductor substrate to a second predetermined temperature that is higher than the first predetermined temperature.

8. A method of fabricating a semiconductor device capable of high-speed switching operation, which method comprises:

(a) providing a semiconductor substrate comprising a first region of a first conductivity type exposed at part a first of a pair of opposite main faces of the substrate, and a second region of a second conductivity type, opposite to the first conductivity type, disposed contiguous to the first region and exposed at the first main face of the substrate so as to surround the first region, the first and second regions creating a pn-junction therebetween, the semiconductor



substrate having an insulating covering on the first main face of the semiconductor substrate, the insulating covering having an aperture exposing part of the first semiconductor region;

(b) forming a layer of gold at least on that part of the first semiconductor region which is exposed through the aperture in the insulating covering;

(c) causing the diffusion of gold from the gold layer into the semiconductor substrate by heating the semiconductor substrate, with the insulating covering formed thereon, to a first predetermined temperature;

(d) removing the remaining gold layer from the exposed surface of the first semiconductor region;

(e) activating the diffused gold by heating the semiconductor substrate to a second predetermined temperature that is higher than the first predetermined temperature; and

(f) forming an electrode in electrical connection to the first semiconductor region.

4,963,510

METHOD AND APPARATUS FOR PROVIDING INTERCONNECTION BETWEEN METALLIZATION LAYERS ON SEMICONDUCTORS DEVICES

Bobby A. Roane, Manvel, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 115,282, Nov. 2, 1987, Pat. No. 4,873,565. This application Jul. 27, 1989, Ser. No. 386,826

Int. Cl.[5] H01L *21/44, 21/48*

U.S. Cl. 437—192 **14 Claims**

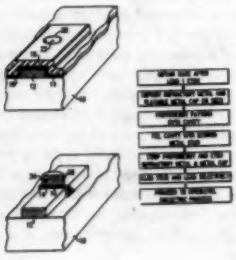
1. A method for interconnecting metallization levels separated by an insulator on semiconductor devices, comprising the steps of:

forming a diffusion barrier over a first level of metallization;

forming a photoresist layer over said diffusion barrier; forming a cavity in said photoresist;

filling the cavity with a conductor to form a solid stud over said diffusion barrier;

stripping the remaining photoresist; and



applying an insulator such that the stud extends through the insulator for connection to a second level of metallization.

4,963,511

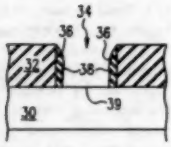
METHOD OF REDUCING TUNGSTEN SELECTIVITY TO A CONTACT SIDEWALL

Gregory C. Smith, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 30, 1987, Ser. No. 126,450

Int. Cl.[5] H01L *21/00, 21/02, 21/28, 21/88*

U.S. Cl. 437—192 **12 Claims**



1. A method for forming a contact plug on a surface of a semiconductor body, comprising the steps of:

forming a dielectric layer over the surface of the semiconductor body, said dielectric layer having an aperture therethrough with sidewalls comprising silicon nitride;

depositing a metal into said aperture in such a manner that said metal deposits upon the silicon nitride of the sidewalls of said aperture at a substantially greater rate than upon the surface of said dielectric layer.

4,963,512

METHOD FOR FORMING CONDUCTOR LAYERS AND METHOD FOR FABRICATING MULTILAYER SUBSTRATES

Shoichi Iwanaga, Yokohama; Akio Fujiwara, Fujisawa; Takayoshi Sowa, Fujisawa, and Hitoshi Yokono, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 29,219, Mar. 23, 1987, abandoned. This application Dec. 8, 1988, Ser. No. 281,879

Claims priority, application Japan, Mar. 25, 1986, 61-64970; May 8, 1986, 61-103765

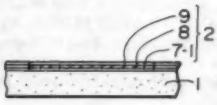
Int. Cl.[5] H01L *21/283*

U.S. Cl. 437—192 **10 Claims**

1. A method of forming a conductor layer on a substrate comprising, in sequence, the steps of:

previously forming a metal underlayer on a surface of a substrate designated to have a conductor formed thereon, said metal underlayer comprising an upper layer of chromium and said metal underlayer being patterned to have a pattern slightly larger than and similar to a desired conductor pattern;

forming a polyimide insulation layer over said substrate surface, said polyimide insulation layer being patterned by dry etching to form a groove and to expose a portion of said metal underlayer on which said desired conductor pattern is to be formed;



removing the upper layer of chromium with wet etching after formation of the groove to expose a metal layer of the underlayer active to electroless plating; and

disposing a plating layer in the groove and on the exposed portion of said metal underlayer by carrying out electroless plating while applying said polyimide insulation layer as a mask and thereby forming a conductor layer with a high aspect ratio ranging from 0.6 to 1.5.

4,963,513

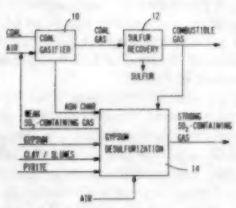
COAL GASIFICATION COGENERATION PROCESS

Jerome H. Marten, Baton Rouge, La., assignor to Florida Institute of Phosphate Research, Lakeland, Fla.

Filed May 24, 1989, Ser. No. 356,752

Int. Cl.[5] C01J *3/14, 3/16, 3/84;* **C01B** *17/50*

U.S. Cl. 48—210 **31 Claims**



1. A process for the coproduction of a combustible first gas stream usable as an energy source, a sulfur-dioxide-containing second gas stream usable as a source for oxidant in the gasification of coal and a sulfur-dioxide-containing third gas stream usable as a feedstock for the production of sulfuric acid, said process comprising the steps of:

(a) reacting coal in a coal gasification zone in the presence of an oxidant under partial coal-gasifying conditions to produce carbonaceous char and a crude gas stream;

(b) separating sulfur-containing compounds from the crude gas stream in a sulfur recovery zone to produce a combustible first gas stream and elemental sulfur;

(c) reacting said carbonaceous char and gypsum in a reaction zone in proportions such that the non-gypsum portion of the carbonaceous char and gypsum mixture contains sufficient reducing potential to reduce sulfur in the gypsum to gaseous compounds of sulfur in a +4or lower oxidation state under reducing conditions to produce first a sulfur-dioxide-containing second gas stream which contains weaker SO_2 produced in an early stage of the reaction zone and removed from said reaction zone, and then a sulfur-dioxide-containing third gas stream which contains concentrated SO_2 recovered from a later stage of the reaction zone.

4,963,514

CERAMIC MULLITE-SILICA GLASS COMPOSITE

Michio Horiuchi, Koshoku, and Tsuyoshi Machii, Suzaka, both of Japan, assignors to Shinko Electric Industries Co., Ltd., Nagano, Japan

Filed Mar. 1, 1989, Ser. No. 317,636
Claims priority, application Japan, Mar. 2, 1988, 63-49315
Int. Cl.[5] C04B 35/18
U.S. Cl. 501—32 5 Claims

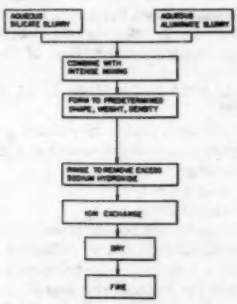
1. A mullite-silica glass composite ceramic consisting essentially of the product formed by firing at a temperature of 1500° to 1650° C. a starting material mixture consisting essentially of mullite powder, 10–70% by weight of silicon dioxide powder and 0.1–5% by weight, based on the mullite powder, of a group IIIA element compound.

4,963,515

LIGHTWEIGHT HYDROGEL-BOUND AGGREGATE SHAPES AND PROCESS FOR PRODUCING SAME

Richard L. Helferich, Clayton, Ohio, assignor to The Duriron Company, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 127,942, Dec. 2, 1987, Pat. No. 4,814,300. This application Nov. 18, 1988, Ser. No. 273,208
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[5] C04B 38/02, 35/18
U.S. Cl. 501—84 10 Claims



1. A process for manufacturing lightweight, hydrogel-bound aggregate shapes having a bulk density of less than about 40 pounds per cubic foot, comprising the steps of:

(a) providing a foamable composition comprised of an aqueous admixture of effective amounts of an alkali metal silicate, an alkali metal aluminate, surfactant, metal powder, particulate aggregate material and viscosity-modifying and gel-strengthening agent, said foamable composition having a total solids content of at least about 70% by weight, a total aggregate content of at least about 60% by weight, said aggregate material having a particle size distribution such that greater than about 70% thereof is of a particle size of 200 microns or less, and wherein said viscosity-modifying and gel-strengthening agent comprises finely-divided spherical particles of fumed metal oxide in an amount effective to reduce the starting viscosity of said foamable composition to less than about 40,000 cps;

(b) forming said foamable composition into a foamed, porous, self-supporting hydrogel-bound aggregate of desired configuration as a consequence of reaction between components of said composition to form a self-setting alkali metal aluminosilicate hydrogel which binds components of said composition in a self-supporting shape of desired configuration, and reaction between said metal powder and alkali materials in said composition to produce therein hydrogen gas bubbles which, in conjunction with said surfactant, develop in said composition a significant degree of porosity prior to the setting of said hydrogel; and

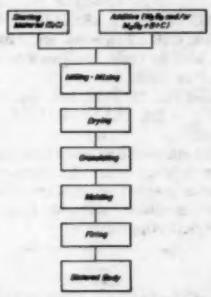
(c) drying said self-supporting foamed, porous, hydrogel-bound aggregate to remove moisture therefrom and produce a lightweight, hydrogel-bound aggregate shape having a bulk density of less than about 40 pounds per cubic foot.

4,963,516

SIC COMPLEX SINTERED BODIES AND PRODUCTION THEREOF

Shinji Kawasaki, Nagoya, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Jul. 21, 1988, Ser. No. 222,554
Claims priority, application Japan, Jul. 28, 1987, 62-186753; Sep. 30, 1987, 62-244161
Int. Cl.[5] C04B 35/56
U.S. Cl. 501—90 12 Claims



1. A pressureless sintered silicon carbide complex sintered body consisting essentially of 20 to 99 wt% of SiC, 70 to 5 wt% of W_2B_5, and 0.5 to 5 wt% of at least one material selected from the group consisting of boron, carbon, and boron carbide.

5. A pressureless sintered silicon carbide complex sintered body consisting essentially of 20 to 99 wt % of SiC, 70 to 0.5 wt % of MoB_2, and 0.5 to 5 wt % of at least one material selected from the group consisting of boron, carbon, and boron carbide, wherein said sintered body consists crystalline phases of MoB_2 and SiC.

4,963,517

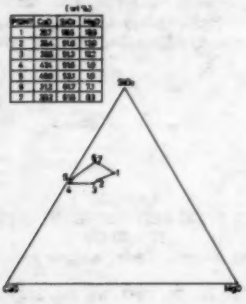
SINTERED CERAMIC BODY WITH EXCELLENT REFRACTORIES (HEAT RESISTANCE) AND MACHINABILITY AND METHOD OF MANUFACTURE OF THE SAME

Kazumasa Goto; Hiroto Shin; Hideki Ishida; Yasuo Goto, and Akira Iwahashi, all of Aichi, Japan, assignors to Inax Corporation, Aichi, Japan

Filed Feb. 16, 1988, Ser. No. 156,612
Int. Cl.[5] C04B 35/02
U.S. Cl. 501—122 7 Claims

1. A sintered ceramic body, consisting essentially of a composition of CaO–SiO_2–MgO wherein the weight % of each component falls within the polygon described in FIG. 1 and up to 10% by weight feldspar based on the amount of wollastonite

formed on firing, said composition being fired at a temperature between 1,200° C. and 1,350° C. and mainly containing beta-



wollastonite so that the sintered ceramic body has high strength, excellent refractoriness and machinability.

4,963,518

SILANATED METAL-PILLARED INTERLAYERED CLAY

Steven D. Landau, Union Township, and James A. Hinsenkamp, St. Bernard, both of Ohio, assignors to Quantum Chemical Corporation, New York, N.Y.

Filed Jul. 13, 1989, Ser. No. 379,129

Int. Cl.[5] B01J 21/16

U.S. Cl. 502—62 12 Claims

11. A silanated aluminum-pillared interlayered clay comprising the reaction product of an aluminum-pillared interlayered clay and a silanating agent selected from the group consisting of dimethyldichlorosilane, and the hydrolyzed product of 2-(2-trichlorosilylethyl)pyridine.

4,963,519

COMPOSITE ADSORBENT

Seiji Okabayashi; Hirofumi Watanabe, both of Nakajo; Kiyoshi Abe, and Masahide Ogawa, both of Shibata, all of Japan, assignors to Mizusawa Industrial Chemcals, Ltd., Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 299,332

Claims priority, application Japan, May 23, 1988, 63-123924

Int. Cl.[5] B01J 20/08, 20/10, 20/22

U.S. Cl. 502—63 21 Claims

6. A composite adsorbent which consists of a molded body of a homogeneous mixture comprising 30 to 70% by weight of powdery active carbon, 5 to 70% by weight of hydrous alumina of the pseudoboehmite type and 5 to 60% by weight of a natural or synthetic smectite type clay mineral and has a pack density of 500 to 700 g/l and an average pore radius of 13 to 20 Å.

16. The composite adsorbent of claim 6 containing from 10 to 40% by weight of the natural or synthetic smectite type clay mineral.

4,963,520

METAL-CONTAINING SPINEL COMPOSITION AND PROCESS OF USING SAME

Jin S. Yoo, Flossmoor; Cecelia A. Radlowski, Riverside, both of Ill.; John A. Karch, Marriottsville, and Alakananda Bhattacharyya, Columbia, both of Md., assignors to UOP, Des Plaines, Ill.

Continuation of Ser. No. 848,954, Apr. 7, 1986, Pat. No. 4,790,982. This application Aug. 1, 1988, Ser. No. 180,577

Int. Cl.[5] B01J 29/06, 23/02, 21/04

U.S. Cl. 502—64 40 Claims

21. A composition of matter comprising, in intimate admixture, a major amount of solid particles capable of promoting hydrocarbon conversion at hydrocarbon conversion conditions, and of discrete entities having a chemical make-up different from said solid particles and comprising at least one metal-containing spinel which includes a first metal and a second metal having a valence higher than the valence of said first metal, at least one component of a third metal other than said first and second metals component effective to promote the oxidation of sulfur dioxide to sulfur trioxide at sulfur dioxide oxidation conditions, and a minor amount of at least one component of a fourth metal other than said first, second and third metals effective to promote the reduction of first metal sulfate at first metal sulfate reduction conditions; provided that in the event said third metal is rare earth metal, said fourth metal is other than vanadium.

22. The composition of claim 21 wherein said hydrocarbon conversion comprises hydrocarbon cracking in the substantial absence of added molecular hydrogen, at least one of said solid particles and discrete entities includes crystalline aluminosilicate effective to promote said hydrocarbon cracking and a major amount by weight of said solid particles have diameters in the range of about 10 microns to about 250 microns.

4,963,521

EXHAUST-GAS CATALYST WITH REDUCED TENDENCY TO STORE SULFUR OXIDES AND TO EMIT HYDROGEN SULFIDE AND PROCESS FOR PREPARING THE CATALYST

Bernd Engler, Hanau; Edgar Koberstein, Alzenau, and Egbert Lox, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed May 1, 1989, Ser. No. 345,721

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1988, 3830318

Int. Cl.[5] B01J 21/02, 21/04, 23/10, 23/40

U.S. Cl. 502—207 12 Claims

1. A catalyst for purification of exhaust gases of internal combustion engines comprising a carrier of a transition aluminum oxide containing

2 to 70% by weight CeO_2

0 to 20% by weight ZrO_2,

an active noble metal component phase consisting of 0.01 to 3% by weight platinum and/or palladium, and optionally rhodium, with a weight ratio between platinum and/or palladium and the optional rhodium of 2:1 to 30:1, and

0.2 to 25% by weight B_2O_3 relative to Al_2O_3.

4,963,522

HEAT TRANSFER SHEET

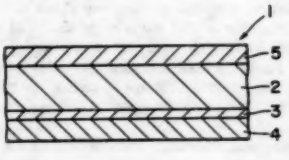
Noritaka Egashira, and Naoto Satake, both of Shiajuku, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Nov. 18, 1988, Ser. No. 274,952

Claims priority, application Japan, Jul. 26, 1988, 63-185800; Sep. 29, 1988, 63-245688; Oct. 17, 1988, 63-261262

Int. Cl.[5] B41M 5/035, 5/26

U.S. Cl. 503—227 6 Claims



1. A heat transfer sheet for an electrothermal transfer system, comprising:

a substrate sheet;

a dye layer formed on one surface of said substrate sheet, said dye layer comprising a sublimable dye and a binder; and

a resistance layer which is capable of generating heat by electrical current formed on the other surface of said substrate sheet, said resistance layer comprising a heat-resistant resin, an electroconductive substance and a slip property imparting agent for lowering the frictional resistance between the resistance layer and an electrode head during electrothermal transfer.

4,963,523

HIGH-T_c SUPERCONDUCTING UNIT HAVING LOW CONTACT SURFACE RESISTIVITY AND METHOD OF MAKING.

John W. Ekin, Boulder, Colo.; Armand J. Panson, and Betty A. Blankenship, both of Pittsburgh, Pa., assignors to The United States of America as represented by the Secretary of the Commerce, Washington, D.C. and Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 6, 1987, Ser. No. 117,259

Int. Cl.[5] C23C *14/04, 14/02, 14/34;* B05D *5/12*

U.S. Cl. 505—1 21 Claims

1. A method for making a low surface resistivity contact to a high-Tc oxide superconductor with at least one surface, subjecting said surface of said superconductor to abrading or etching in a manner such that said surface assumes a substantially non-degraded state, maintaining said surface in said substantially non-degraded state, and depositing a noble metal on said surface by sputter or evaporative deposition while said surface remains in said substantially non-degraded state to form a metallic contact pad on said surface of said superconductor with low surface resistivity being established between said contact pad and said surface.

4,963,524

SPUTTERING DEVICE FOR MANUFACTURING SUPERCONDUCTING OXIDE MATERIAL AND METHOD THEREFOR

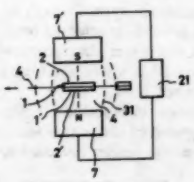
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Filed Sep. 30, 1988, Ser. No. 246,611

Claims priority, application Japan, Sep. 24, 1987, 62-241875; Sep. 24, 1987, 62-241876

Int. Cl.[5] H01L *39/00;* C23C *14/35*

U.S. Cl. 505—1 7 Claims



3. A method for sputtering a thin film of a superconducting oxide material generally represented by the expression $(A_{1-x}B_x)_y Cu_z O_w$, where x=0.1 to 1, y=2.0 to 4.0, z=1.0 to 4.0 and w=4.0 to 10.0, A is at least one member selected from the group of Sc (Scandium), Y (yttrium), Gd (gadolinium), Yb (ytterbium), Eu (europium), Tb (terbium), Dy (dysprosium), Ho (holmium), Er (erbium), Tm (thulium), Lu (lutetium), and other lanthanoids, and B is at least one member selected from the group of Ba (barium), Sr (strontium); and Ca (calcium); or by the expression $(A_{1-x}B_x)_y Cu_z O_w$, where A is one or more elements of Group V_b of the Periodic Table, B is one or more elements of Group IIa of the Periodic Table; x=0.3 to 1; y=2.0 to 4.0; z=1.0 to 4.0; and w=4.0 to 10.0 onto a substrate comprising the steps of:

providing at least one target having a sputtering surface comprising elements of said superconducting oxide material and a substrate having a film-forming surface portion on which said superconducting oxide material is to be formed;

creating a magnetic field so that the film-forming surface portion is placed in the magnetic field with the magnetic field induced normal to the substrate surface portion and the strength of the magnetic field is sufficient to align the c axis of the superconducting oxide material perpendicular to the film forming surface portion; and

sputtering said superconducting oxide material onto the film-forming surface portion, so that said thin film of superconducting oxide material is formed on the film-forming surface portion of said substrate.

4,963,525

ACYLCARNITINES AS ABSORPTION-ENHANCING AGENTS FOR DRUG DELIVERY THROUGH MUCOUS MEMBRANES OF THE NASAL, BUCCAL, SUBLINGUAL AND VAGINAL COMPARTMENTS

Jose Alexander; Joseph A. Fix, and A. J. Repta, all of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 130,919, Dec. 10, 1987, Pat. No. 4,847,298, which is a division of Ser. No. 766,378, Aug. 16, 1985, Pat. No. 4,731,360. This application May 16, 1989, Ser. No. 353,739

Int. Cl.[5] A61K *37/00, 37/26*

U.S. Cl. 514—11 10 Claims

1. A pharmaceutical composition for enhancing nasal, buccal, sublingual and vaginal absorption of a formulation comprising a therapeutically effective dosage amount of a polypeptide drug and an acylcarnitine absorption enhancing agent of the formula:

$$[(CH_3)_3N^-CH_2CH(OCOR)CH_2CO_2H]X^-$$

wherein R is alkyl (C_2–C_{20}), alkenyl (C_2–C_{20}) with 1 to 3 hydroxy groups, ketoalkyl (C_4–C_{20}), hydroxyalkeynl (C_5–C_{20}), carboxyalkyl (C_5–C_{20}), carbalkoxylakyl (C_5–C_{20}), arylalkyl (C_7–C_{20}) or alkylaryl (C_7–C_{20}) and X is a pharmaceutically acceptable counterion.

4,963,526

ORAL INSULIN AND A METHOD OF MAKING THE SAME

Bernard Ecsnow, Wilmette, Ill., assignor to Synthetic Blood Corporation, Deerfield, Ill.

Continuation of Ser. No. 835,550, Mar. 3, 1986, Pat. No. 4,849,405, which is a continuation-in-part of Ser. No. 608,483, May 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 711,048, Mar. 11, 1985, Pat. No. 4,599,242, which is a continuation-in-part of Ser. No. 711,066, Mar. 12, 1985, abandoned. This application Nov. 2, 1988, Ser. No. 267,749

Int. Cl.[5] A61K *37/26*

U.S. Cl. 514—3 39 Claims

1. A composition of matter useful as an oral dosage form of insulin; said composition derived from a non-toxic two phase liquid coacervate composition, both phases being aqueous;

(a) one of said phases being a relatively non-polar coacervate phase;

(b) the other of said phases being a relatively polar equilibrium water phase;

(c) said relatively non-polar coacervate phase being insoluble in and in equilibrium with said relatively polar liquid aqueous phase;

(d) said two phase coacervate composition including an effective amount of insulin in the coacervate phase of the coacervate composition, to form a delivery system for the oral administration of insulin.

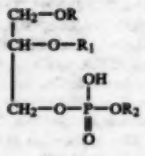
4,963,527

PHOSPHOLIPID COMPLEXES OF EXTRACTS OF *VITIS VINIFERA*, THEIR PREPARATION PROCESS AND PHARMACEUTICAL AND COSMETIC COMPOSITIONS CONTAINING THEM

Ezio Bombardelli, Milan, Italy, and Michel Sabadie, Bernay, France, assignors to INDENA S.p.A., Milan, Italy and SANOFI, Paris, France

Filed Jan. 14, 1988, Ser. No. 143,764
Claims priority, application Italy, Jan. 14, 1987, 19084 A/87
Int. Cl.[5] A61K *31/70, 31/685*
U.S. Cl. 514—25 12 Claims

1. Complexes resulting from the reaction of flavonoids extracted from *Vitis vinifera* with phospholipids selected from the group consisting of soy lecithin, egg lecithin, phospholipids from bovine and porcine brains and skins, and compounds of the formula:



in which R and R_1, being indential or different, represent acyl groups from natural fatty acids and R_2 represents $(CH_2)_2N^+(CH_3)_3$, $(CH_2)_2NH_2$, or $CH_2—CH(COOH)NH_2$, wherein the molar ratio of phospholipid to flavonoid is between 0.5 and 3.

4,963,528

METAL COMPLEXES OF N-METHYL-11-AZA-10-DEOXO-10-DIHYDRO-ERYTHROMYCIN A OR 11-AZA-10-DEOXO-10-DIHYDRO-ERYTHROMYCIN A, METHOD FOR THE MANUFACTURE THEREOF AND THEIR USE IN THE MANUFACTURE OF PHARMACEUTICALS

Zlatko Vajtner; Nevenka Lopotar, and Slobodan Djoki , all of Zagreb, Yugoslavia, assignors to Sour Pliva, Yugoslavia

Filed Sep. 9, 1987, Ser. No. 94,555
Claims priority, application Yugoslavia, Sep. 12, 1986, 1592/86
Int. Cl.[5] A61K *31/71;* C07H *17/08*
U.S. Cl. 514—29 14 Claims

8. A pharmaceutical composition which comprises an antibiotic effective amount of the 2:1 complex of N-methyl-11-aza-10-deoxo-10-dihydroerythromycin A or 11-aza-10-deoxo-10-dihydroerythromycin A with a bivalent metal chosen from the group consisting of Cu^{+2}, Zn^{+2}, Ni^{+2} and Ca^{+2}.

4,963,529

STABLE GROWTH HORMONE RELEASING FACTOR PREPARATION

Keiji Fujioka, Hyogo; Shigeji Sato, and Yoshihiro Takada, both of Osaka, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

Continuation of Ser. No. 813,013, Dec. 24, 1985, abandoned. This application Mar. 8, 1988, Ser. No. 168,617
Claims priority, application Japan, Dec. 24, 1984, 59-280036; Sep. 18, 1985, 60-207244
Int. Cl.[5] A61K *37/36*
U.S. Cl. 514—12 12 Claims

1. A growth hormone releasing composition consisting essentially of human growth hormone releasing factor (GRF) and a stability enhancing amount of a stabilizing agent selected from the group consisting of human serum albumin or glycine wherein said GRF has the amino acid sequence

H—Tyr—Ala—Asp—Ala—Ile—Phe—Thr—Asn—Ser—Tyr—Arg—Lys—Val—Leu—Gly—Gln—Leu—Ser—Ala—Arg—Lys—Leu—Leu—Gln—Asp—Ile—Met—Ser—Arg—Gln—Gln—Gly—Glu—Ser—Asn—Gln—Glu—Arg—Gly—Ala—Arg—Ala—Arg—Leu—NH_2 or the amino acid sequence H—Tyr—Ala—Asp—Ala—Ile—Phe—Thr—Asn—Ser—Tyr—Arg—Lys—Val—Leu—Gly—Gln—Leu—Ser—Ala—Arg—Lys—Leu—Leu—Gln—Asp—Iln—Met—Ser—Arg—NH_2.

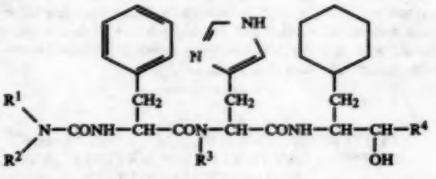
4,963,530

RENIN INHIBITOR PEPTIDE COMPOUNDS, A PROCESS FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Keiji Hemmi; Masahiro Neya; Keisuke Imai; Natsuko Kayakiri, and Masashi Hashimoto, all of Tsukuba, Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

Filed Mar. 21, 1988, Ser. No. 171,269
Claims priority, application United Kingdom, Mar. 27, 1987, 8707412
Int. Cl.[5] H61K *37/02;* C07K *5/06*
U.S. Cl. 514—19 10 Claims

1. A compound of the formula:



wherein R^1 is aryl; aryl substituted with a substituent selected from the group consisting of halogen and halo lower alkyl; lower alkyl or cyclo lower alkyl; and R^2 is hydrogen or lower alkyl, or R^1 and R^2 taken together with the attached nitrogen atom form a heterocyclic group selected from the group consisting of morpholino, thiomorpholino, pyrrolidin-1-yl, piperidino, piperazin-1-yl, pyrrolin-1-yl, 1,4-dihydropyridin-1-yl, 1,2,3,6-tetrahydropyridin-1-yl, 1,2,3,4-tetrahydroisoquinolin-2-yl and 1,2,3,4-tetrahydroquinolin-1-yl, or the above groups substituted with a substituent selected from the group consisting of lower alkyl and lower alkoxycarbonyl; R^3 is hydrogen or lower alkyl, and R^4 is lower alkyl, or a pharmaceutically acceptable salt thereof.

6. A pharmaceutical composition, comprising an effective amount of a compound of claim 1, in association with a pharmaceutically acceptable carrier or excipient.

4,963,531

AZITHROMYCIN AND DERIVATIVES AS ANTIPROTOZOAL AGENTS

Jack S. Remington, Menlo Park, Calif., assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 16, 1988, Ser. No. 359,676
Int. Cl.[5] A61K *31/70, 31/71*
U.S. Cl. 514—29 5 Claims

1. A method of treating or preventing an infection in a mammal due to a strain of *Toxoplasma gondii* species which comprises administering to said mammal an anti-*Toxoplasma gondii* species effective amount of:

azithromycin;
4"-epi-azithromycin;
4"-amino-4"-deoxy-azithromycin; or
4"-epi-4"-amino-4"-deoxy-azithromycin;

or a pharmaceutically acceptable salt thereof.

4,963,532

DSRNA-BASED PREVENTION OF VIRAL ESCAPE

William A. Carter, Birchrunville, Pa., assignor to HEM Research, Inc., Rockville, Md.

Continuation-in-part of Ser. No. 125,098, Nov. 25, 1987, abandoned. This application Sep. 9, 1988, Ser. No. 242,341
The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.
Int. Cl.[5] A61K *31/70*
U.S. Cl. 514—44 11 Claims

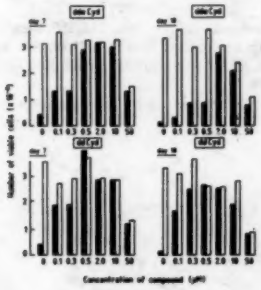
1. A method of protecting an animal or animal cells susceptible to human retroviral infection against viral-induced pathology secondary to antigenic drift, as evidenced by molecular rearrangement in the viral particle structure, comprising exposing the animal or cells isolated from the animal to a mismatched dsRNA which is a complex of a polyinosinate and a polycytidylate containg from 1 in 5 to 2 in 30 uracil or guanadine bases, or $rI_n{\cdot}r(C_{29}G)_n$ or $rI_n{\cdot}r(C_{11\text{-}14}U)_n$.

4,963,533

THERAPEUTIC APPLICATION OF DIDEOXYCYTIDINENE

Erik D. A. de Clercq, Leuven; Piet A. M. M. Herdewijn, Kessel-Lo, both of Belgium; Samuel Broder, Bethesda, and Jan M. R. Balzarini, Rockville, both of Md., assignors to Stichting Rega VZW (REGA), Louvain, Belgium and The Government of the United States of America, Washington, D.C.

Filed Oct. 24, 1986, Ser. No. 922,957
Int. Cl.[5] A61K *31/70*
U.S. Cl. 514—49 6 Claims



1. A method of treating a patient suffering from AIDS and AIDS related diseases, which comprises, administering to affected cells of said patient a therapeutically effective amount of 2',3'-didehydro-2',3'-dideoxycytidine for mitigating the replication and the effects of HIV.

4,963,534

PROCESS FOR SOLUBILIZING POLYANOINIC BACTERIAL POLYSACCHARIDES IN APROTIC SOLVENTS

Ralph Calabria, East Brunswick; Frederick W. Hartner, Somerville, both of N.J., and John T. Sisko, Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 19, 1989, Ser. No. 353,987
Int. Cl.[5] C07H *1/00*; C07G *17/00*; C08B *37/00*; A61K *31/00*
U.S. Cl. 514—54 6 Claims

1. A process for solubilizing polysaccharide in an aprotic solvent comprising:

(a) adding an aqueous solution of a calcium salt of a polysaccharide to a suitable amount of aqueous oxalic acid;

(b) adjusting the pH of the resulting mixture of step (a) to about 7 with addition of a tetra-n-alkylammonium hydroxide to replace the calcium counterion with tetra-n-alkylammonium ion and enhance solubility of the polysaccharide in aprotic solvents;

(c) removing calcium oxalate from solution; and

(d) replacing the water with the aprotic solvent.

4,963,535

NONIRRITANT COSMETIC COMPOSITIONS CONTAINING A FOAMING SURFACTANT AND A NONIONIC SURFACTANT CONTAINING TWO FATTY CHAINS

Henri Sebag, Paris, and Guy Vanlerberghe, Claye-Souilly, both of France, assignors to L'Oreal, Paris, France

Filed Feb. 2, 1988, Ser. No. 151,462
Claims priority, application Luxembourg, Feb. 3, 1987, 86756
Int. Cl.[5] A61K *7/42, 7/06*
U.S. Cl. 514—54 11 Claims

1. A cosmetic composition for cleansing hair or the skin or removing make-up from the eyes, said composition comprising

(a) at least one foaming surface-active agent selected from the group consisting of an anionic, nonionic, amphoteric, zwitterionic and cationic foaming surfactant and a mixture thereof,

(b) a carrier selected from the group consisting of water; a mixture of water and a C_1–C_4 lower alcohol; and an oil selected from the group consisting of a vegetable oil, a mineral oil and an animal oil and

(c) a nonfoaming, nonionic product having the formula:

$$R{-}O{-}C_2H_3{-}(CH_2R_1{-}O)_pC_2H_3O{-}CH_2OH)]_nH \quad (I)$$

wherein

R represents a C_8–C_{20} alkyl radical,

R_1 represents a C_7–C_{17} alkyl radical or a C_8–C_{20} alkoxy radical,

$R+R_1$ contain from 21 to 31 carbon atoms,

p represents the exact value of 1 or a statistical means value between 1 and 2, and

n represents a statistical means value of between 2 and 10, the weight ratio c:a being between 5:100 and 50:100.

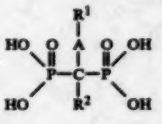
4,963,536

DIPHOSPHONIC ACID COMPOUNDS, AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME USEFUL FOR TREATING BONE DISEASES

Teruo Oku; Eishiro Todo; Chiyoshi Kasahara, all of Sakuramura; Katsuya Nakamura, Ystabemachi; Hiroshi Kayakiri, Sakuramura, and Masashi Hashimoto, Sakuramura, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

Division of Ser. No. 42,444, Apr. 24, 1987, Pat. No. 4,857,513.
This application Apr. 6, 1989, Ser. No. 333,953
Claims priority, application United Kingdom, Apr. 24, 1986, 8610019; Aug. 5, 1986, 8619074; Mar. 6, 1987, 8705347
Int. Cl.[5] C07F *9/58, 9/60, 9/6506*; A61K *31/685*
U.S. Cl. 514—76 3 Claims

1. A compound of the formula:



wherein

R^1—A— is a group of the formula:

$$R^1{-}SO_2{-}NH{-}$$

in which

R^1 is phenyl, naphthyl, pyridyl, imidazolyl, thienyl, quinolyl, benzothienyl or benzothiazolyl, unsubstituted or substi-

tuted with a substituent selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, halo(lower) alkyl, lower alkoxycarbonyl, lower alkanoylamino, lower alkylsulfonylamino and halogen, and

R^2 is hydrogen or lower alkyl, or a pharmaceutically acceptable salt thereof.

3. A method for the treatment of bone diseases having abnormal bone metabolism in human beings or animals comprising administering an effective amount of a compound of claim 1 or pharmaceutically acceptable salt thereof.

4,963,537

LABDANE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND USE

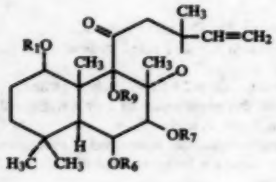
Raymond W. Kosley, Jr., Bridgewater, and Robert J. Cherill, Somerset, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 204,791, Jun. 10, 1988, Pat. No. 4,851,397, which is a division of Ser. No. 26,091, Mar. 16, 1987, Pat. No. 4,771,049, which is a division of Ser. No. 921,647, Oct. 20, 1986, Pat. No. 4,677,103, which is a division of Ser. No. 848,053, Apr. 4, 1986, Pat. No. 4,639,443, which is a continuation-in-part of Ser. No. 707,283, Mar. 1, 1985, abandoned. This application Apr. 26, 1989, Ser. No. 343,317

Int. Cl.[5] A61K *31/35;* **C07D** *311/92*

U.S. Cl. 514—96 **26 Claims**

1. A compound of the formula

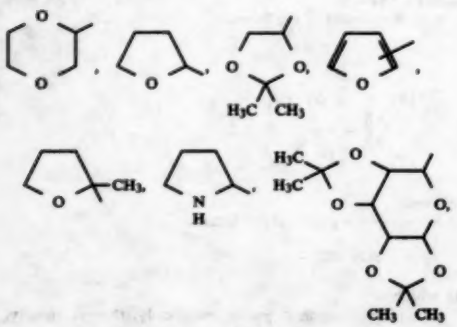


wherein:

(a) R_1 is hydrogen;

(b) R_6 and R_7 are each independently hydrogen, a group of the formula R_8CO wherein R_8 is hydrogen, loweralkyl,

CH_3CHOH, $HOCH_2CHOH$, $(CH_3)_2COCH_2OCH_2CH_2OCH_3$, $CH_3C(CH_3)OH$, $HOCH_2C(CH_3)OH$, $HOCH_2C(CH_3)_2$, $HOC(CH_2OH)CH_2CH_3$, $CH_3C(CH_2OH)_2$, $C(CH_2OH)_3$,



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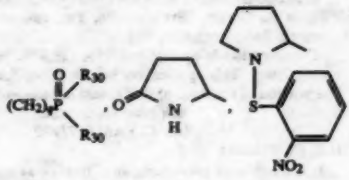


wherein R_{30} is loweralkyl and q is 1, 2 or 3; a group of the formula $R_{10}OCR_{31}R_{32}(CH_2)_n$ wherein R_{10} is hydrogen or loweralkyl, R_{31} is hydrogen or loweralkyl, R_{32} is hydrogen or loweralkyl, and n is 0, 1, 2 or 3 ; or R_6 and R_7 taken together form a group of the formula CO or a group of the formula SO;

(c) R_9 is hydrogen; with the proviso:

(d) that R_6 is not hydrogen or R_8CO wherein R_8 is hydrogen or loweralkyl when R_7 is hydrogen or R_8CO wherein R_8 is hydrogen or loweralkyl and R_1 is hydrogen;

the optical and geometric isomers thereof, or a pharmaceutically acceptable acid addition salt thereof.

25. A method of reducing intraocular pressure in mammals comprising administering to a mammal requiring intraocular pressure reduction, an intraocular pressure reducing effective amount of a compound of claim 1.

4,963,538

5-OXYGENATED HMG-COA REDUCTASE INHIBITORS

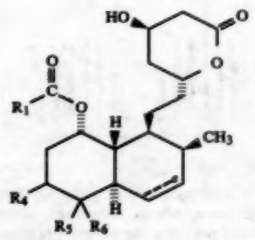
Mark E. Duggan, Wynnewood, and George D. Hartman, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 213,010, Jun. 29, 1988, abandoned. This application Mar. 13, 1989, Ser. No. 322,398

Int. Cl.[5] A61K *31/365;* **C07D** *309/30*

U.S. Cl. 514—99 **20 Claims**

1. A compound represented by the structural formula (I):



(I)

wherein:

R_1 is selected from;

(1) C_{1-10} alkyl;

(2) substituted C_{1-10} alkyl in which one or more substituent(s) is selected from

(a) halogen,

(b) hydroxy,

(c) C_{1-10} alkoxy,

(d) C_{1-5} alkoxycarbonyl,

(e) C_{1-5} acyloxy,

(f) C_{3-8} cycloalkyl,

(g) phenyl,

(h) substituted phenyl in which the substituents are X and Y,

(i) C_{1-10} alkyl $S(O)_n$ in which n is 0 to 2,

(j) C_{3-8} cycloalkyl$S(O)_n$,

(k) phenyl$S(O)_n$,

(l) substituted phenyl$S(O)_n$ in which the substituents are X and Y, and

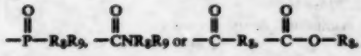
(m) oxo;

(3) C_{1-10} alkoxy;
(4) C_{2-10} alkenyl;
(5) C_{3-8} cycloalkyl;
(6) substituted C_{3-8} cycloalkyl in which one substituent is selected from
(a) C_{1-10} alkyl
(b) substituted C_{1-10} alkyl in which the substituent is selected from
(i) halogen,
(ii) hydroxy,
(iii) C_{1-10} alkoxy,
(iv) C_{1-5} alkoxycarbonyl,
(v) C_{1-5} acyloxy,
(vi) phenyl,
(vii) substituted phenyl in which the substituents are X and Y
(viii) C_{1-10} alkylS(O)$_n$,
(ix) C_{3-8} cycloalkylS(O)$_n$,
(x) phenylS(O)$_n$,
(xi) substituted phenylS(O)$_n$ in which the substituents are X and Y, and
(xii) oxo,
(c) C_{1-10} alkylS(O)$_n$,
(d) C_{3-8} cycloalkylS(O)$_n$,
(e) phenylS(O)$_n$,
(f) substituted phenylS(O)$_n$ in which the substituents are X and Y,
(g) halogen,
(h) hydroxy,
(i) C_{1-10} alkoxy,
(j) C_{1-5}alkoxycarbonyl,
(k) C_{1-5}acyloxy,
(l) phenyl, and
(m) substituted phenyl in which the substituents are X and Y;
(7) phenyl;
(8) substituted phenyl in which the substituents are X and Y;
(9) amino;
(10) C_{1-5} alkylamino;
(11) di(C_{1-5} alkyl)amino;
(12) phenylamino;
(13) substituted phenylamino in which the substituents are X and Y;
(14) phenyl C_{1-10} alkylamino;
(15) substituted phenyl C_{1-10} alkylamino in which the substituents are X and Y;
(16) a member selected from
(a) piperidinyl,
(b) pyrrolidinyl,
(c) piperazinyl,
(d) morpholinyl, and
(e) thiomorpholinyl; and
(17) $R_{10}S$ in which R_{10} is selected from
(a) C_{1-10} alkyl,
(b) phenyl, and
(c) substituted phenyl in which the substituents are X and Y;

R_4 is:
(1) hydrogen;
(2) C_{1-10} alkyl; and
(3) substituted C_{1-10} alkyl in which one or more substituents is selected from
(a) halogen,
(b) hydroxy,
(c) C_{1-10} alkoxy
(d) C_{1-5} alkoxycarbonyl,
(e) C_{1-5} alkylacyloxy,
(f) phenylacyloxy,
(g) phenoxycarbonyl,
(h) phenyl C_{1-5} alkylacyloxy,
(i) phenyl C_{1-5} alkoxy,
(j) amino,
(k) C_{1-5} alkylamino,
(l) di(C_{1-5} alkyl)amino,
(m) phenylamino,
(n) substituted phenylamino in which the substituents are X and Y;
(o) phenyl C_{1-5} alkylamino,
(p) substituted phenyl C_{1-5} alkylamino in which the substituents are X and Y,
(q) C_{3-8} cycloalkyl,
(r) phenyl,
(s) substituted phenyl in which the substituents are X and Y,
(t) phenyl S(O)$_n$,
(u) substituted phenyl S(O)$_n$ in which the substituents are X and Y,
(v) phenyl C_{1-5} alkyl S(O)$_n$,
(w) C_{1-5} alkylS(O)$_n$,
(x) phenylaminoacyloxy,
(y) C_{1-5}alkylaminoacyloxy,
(z) C_{1-5}alkylacylamino,
(aa) di(phenylC_{1-5}alkyl)phosphonyl
(bb) di(C_{1-5}alkyl)phosphinyl
(4) R_4 together with the carbon atom to which it is attached represents a C_{3-8} carbocyclic ring;

R_5 and R_6 independently are H, OH, OR_7 or R_5 and R_6 together with the carbon to which they are attached represent C=O or R_5 and R_6 together with the carbon to which they are attached represent a carboxylic ring of 3 to 7 atoms; provided that when R_5 is H, R_6 is OH or OR_7, and when R_5 is OH, R_6 is H, and when R_5 is OR_7, R_6 is H;

R_7 is



phenylC_{1-3}alkyl, C_{1-5}alkyl;

R_8 and R_9 independently are H, C_{1-3}alkyl, phenylC_{1-3}alkyl or aryl wherein aryl is phenyl, naphthyl, pyridyl, furanyl, thienyl or phenyl, naphthyl, pyridyl, furanyl or thienyl substituted with groups X and Y; provided that when R_7 is

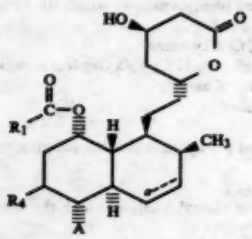
R_8 is not H and when R_7 is

neither R_8 nor R_9 is H;

X and Y are independently selected from:
(a) OH;
(b) halogen,
(c) trifluoromethyl,
(d) C_{1-3}alkoxy,
(e) C_{1-3}alkylocarbonyloxy,
(f) phenylcarbonyloxy,
(g) C_{1-3}alkoxycarbonyl,
(h) phenyloxycarbonyl,
(i) hydrogen,
(j) C_{1-5}alkyl;

halogen is Cl or F;

a is a single bond or a double bond; provided that when a is a double bond and R_5 or R_6 is OH or phenyl C_{1-3} alkoxy, the configuration of the 5-position is α-5-hydroxy or α-5-phenylC_{1-3}alkoxy as represented in formula (I')



wherein A is OH or phenyl C_{1-3}alkoxy, or a pharmaceutically acceptable salt thereof.

19. A method of treating hyperchloesterolemia to a subject in need of such treatment which comprises the administration of an antihyperchloesterolemic effective amount of a compound of claim 1.

4,963,539

PHOSPHONATE AND PHOSPHONAMIDE ENDOPEPTIDASE INHIBITORS

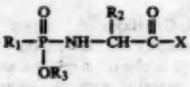
Norma G. Delaney, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 223,121, Jul. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 95,065, Sep. 10, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,550

Int. Cl.[5] A61K *31/66*; C07F *9/09*

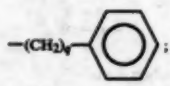
U.S. Cl. 514—119 13 Claims

1. A compound of the formula

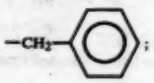


including a pharmaceutically acceptable salt thereof wherein:

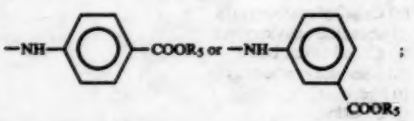
R_1 is straight or branched alkyl of 1 to 4 carbons or



R_2 is straight or branched chain alkyl of 1 to 4 carbons, trifluoromethyl, or



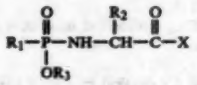
X is



R_3 and R_5 are independently selected from the group consisting of hydrogen, straight or branched chain alkyl of 1 to 4 carbons, and an alkali metal salt ion; and

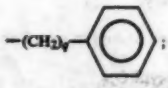
q is an integer from 1 to 4.

2. A compound of the formula

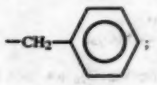


including a pharmaceutically acceptable salt thereof wherein:

R_1 is straight or branched chain alkyl of 1 to 4 carbons or



R_2 is straight or branched alkyl of 1 to 4 carbons, trifluoromethyl, or



X is $—NH—(CH_2)_2—COOR_5$;

R_3 and R_5 are independently selected from the group consisting of hydrogen, straight or branched chain alkyl of 1 to 4 carbons, and an alkali metal salt ion; and

q is an integer from 1 to 4.

4,963,540

METHOD FOR TREATMENT OF PREMENSTRUAL SYNDROME

Wayne S. Maxson, 7505 Hallows Dr., Nashville, Tenn. 37221; Joel T. Hargrove, 820 Hatcher La., Columbia, Tenn. 39401, and Philip G. Meyers, 12505 N. Woodberry Dr., Mequon, Wis. 53092

Division of Ser. No. 851,181, Apr. 16, 1986, abandoned. This application Jan. 13, 1988, Ser. No. 144,535

Int. Cl.[5] A61K *31/56*, *31/23*

U.S. Cl. 514—177 9 Claims

1. A method of treating premenstrual syndrome, comprising orally administering to a woman suffering from premenstrual syndrome a therapeutically effective amount of an oral dosage form of progesterone comprising a suspension of micronized progesterone in an edible oil, said suspension being contained in a pharmacologically acceptable capsule, wherein said dosage form is administered over a period of consecutive days during the second half of the menstrual cycle between ovulation and menstruation in a dosage sufficient to increase blood serum levels of progesterone to at least 10 ng/ml, and wherein said oil is selected from safflower oil and linseed oil.

4,963,541

PYRIMIDO-PYRIMIDINE LIPOXYGENASE INHIBITING COMPOUNDS

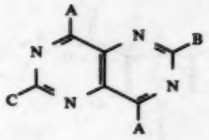
Dee W. Brooks, Libertyville, and Anwer Basha, Lake Forest, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Feb. 22, 1989, Ser. No. 314,008

Int. Cl.[5] A61K *31/505*, *31/535*

U.S. Cl. 514—183 3 Claims

1. A composition for the inhibition of lipoxygenase enzymes comprising a pharmaceutically acceptable carrier and a compound of the formula:



wherein A is perhydroazocinyl; and B and C are independently selected from NHR_3 and NR_4R_5 where R_3, R_4 and R_5 are independently selected from the group consisting of alkyl from one to twelve carbon atoms, cycloalkyl of from three to either carbon atoms and alkylaryl in which the alkyl portion is as previously defined and the aryl portion is selected from phenyl, naphthyl, biphenyl, and terphenyl, each of said alkyl cycloalkyl, and alkylaryl groups being unsubstituted or substituted with one or more substituents selected from the group consisting of hydroxy, alkoxy of from one to twelve carbon atoms, NRR, OCOR, OCONRR, NRCOR and NRCONRR where R is selected from the group consisting of hydrogen, alkyl as previously defined, aryl as previously defined, alkylaryl as previously defined, alkoxy as previously defined and hydroxy, or R_4 and R_5 together can form a heteroaryl group selected from the group consisting of pyridyl, pyrrolyl, pyrimidyl, indolyl, pyrazinyl, isoquinolyl, imidazolyl and carbazolyl; and the pharmaceutically acceptable salts thereof.

4,963,542

CEPHALOSPORIN DERIVATIVES

Mitsuo Numata, Takatsuki; Isao Minamida, Kyoto, and Susumu Tsushima, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 928,686, Nov. 7, 1986, abandoned, which is a continuation of Ser. No. 823,150, Jan. 29, 1986, abandoned, which is a continuation of Ser. No. 195,863, Oct. 10, 1980, abandoned, which is a division of Ser. No. 807,409, Jun. 17, 1977, abandoned. This application May 17, 1989, Ser. No. 353,216

Claims priority, application Japan, Sep. 8, 1976, 51-108101

Int. Cl.[5] C07D *501/38;* A61K *31/545*

U.S. Cl. 514—206 **2 Claims**

1. A compound namely 7-[2-(2-imino-4-thiazolin-4-yL)-2-(syn)-hydoxyiminoacetamide]-3-(4-carbamoylpyridinium methyl)-3-cephem-4-carboxylate or its pharmaceutically acceptable salts.

4,963,543

3-PYROLIDINYLTHIO-1-AZABICYCLO-[3.2.0]HEPT-2-ENE-2-CARBOXYLIC ACID DERIVATIVES AND PROCESSES FOR THE PREPARATION THEREOF

Masayoshi Murata, Osaka; Hideo Tsutsumi, Toyonaka; Keiji Matsuda, Takatsuki; Kohji Hattori, Sakai, and Takashi Nakajima, Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

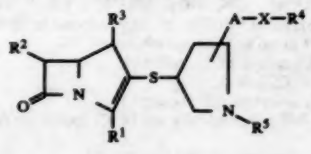
Filed Nov. 17, 1987, Ser. No. 121,881

Claims priority, application United Kingdom, Nov. 24, 1986, 8628063; Dec. 31, 1986, 8631081; Apr. 21, 1987, 8709399; Jul. 17, 1987, 8716937

Int. Cl.[5] C07D *487/04;* A61K *31/40*

U.S. Cl. 514—210 **19 Claims**

1. A compound of the formula:



in which

R^1 is carboxy or protected carboxy,

R^2 is hydroxy(lower)alkyl or protected hydroxy(lower)alkyl,

R^3 is hydrogen or lower alkyl,

R^4 is protected or unprotected hydroxy(lower)alkyl, protected or unprotected hydroxy(lower)alkyl having protected or unprotected amino; halo(lower)alkyl; protected or unprotected carbamoyl(lower)alkyl; protected or unprotected amino(lower)alkyl; protected or unprotected ureido(lower)alkyl; protected or unprotected ureidocarbonyl(lower)alkyl; triazolyl(lower)alkyl; saturated or unsaturated 3 to 8-membered heteromonocyclic group containing at least one heteroatom selected from oxygen, sulfur and nitrogen atom, wherein said heterocyclic group is unsubstituted or substituted by suitable substituent(s) selected from the group consisting of lower alkyl, amino, amino(lower)alkyl, mono(or di)(lower)alkylamino, mono-(or di)(lower)alkylamino(lower)alkyl and imino protective group; or lower alkylsulfonyl;

R^5 is hydrogen, lower alkanimidoyl or imino-protective group,

A is lower alkylene, and

X is sulfur, oxygen, imino or protected imino, provided that when X is oxygen,

then R^4 is not protected or unprotected ureido(lower)alkyl, and pharmaceutically acceptable salts thereof.

4,963,544

3-PYRROLIDINYLTHIO-1-AZABICYCLO[3.2.0]-HEPT-2-ENE-2-CARBOXYLIC ACID COMPOUNDS

Masayoshi Murata, Osaka; Hideo Tsutsumi, Toyonaka; Keiji Matsuda, Takatsuki; Kohji Hattori, Sakai, and Takashi Nakajima, Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

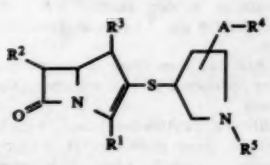
Filed May 5, 1989, Ser. No. 347,579

Claims priority, application United Kingdom, May 23, 1988, 8812160; Mar. 22, 1989, 8906576

Int. Cl.[5] C07D *487/04;* A61K *31/40*

U.S. Cl. 514—210 **10 Claims**

1. A compound of the formula:



in which

R^1 is a carboxy or protected carboxy,

R^2 is hydroxy(lower)alkyl or protected hydroxy(lower)alkyl,

R^3 is hydrogen or lower alkyl,

R^4 is unsaturated, 5 or 6-membered heteromonocyclic group containing 1 to 4 nitrogen atom(s), unsaturated 5 or 6-membered heteromonocyclic group containing 1 to 2 oxygen atom(s) and 1 to 3 nitrogen atom(s), unsaturated 5 or 6-membered heteromonocyclic group containing 1 to 2 sulfur atom(s) and 1 to 3 nitrogen atom(s), or unsaturated 5 or 6-membered heteromonocyclic group containing a sulfur atom, wherein said heterocyclic group may be substituted by one to three substitutent(s) selected from a group consisting of oxo, carboxy(lower)alkyl, protected carboxy(lower)alkyl, amino, protected amino, lower alkylamino, ureido(lower)alkyl, carbamoyl, carbamoyl(lower)alkyl, lower alkyl, lower alkanoyl(lower)alkyl, amino(lower)alkyl, protected amino(lower)alkyl, hydroxy(lower)alkyl, protected hydroxy(lower)alkyl, azido(lower)alkyl, halo(lower)alkyl and imino-protective group,

R^5 is hydrogen, lower alkanimidoyl or imino-protective group, and

A is lower alkylene, or pharmaceutically acceptable salts thereof.

4,963,545

BENZOTHIAZEPINE ANTI-SEIZURE METHOD

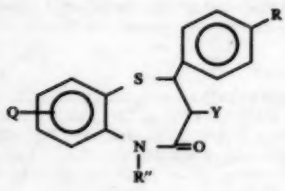
Ray H. Zobrist, and William R. Morrone, both of Olathe, Kans., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Continuation-in-part of Ser. No. 198,054, May 24, 1988, Pat. No. 4,879,289. This application Nov. 22, 1989, Ser. No. 440,376

Int. Cl.[5] A61K *31/55*

U.S. Cl. 514—211 15 Claims

1. A method for ameliorating a generalized tonic clonic type epileptic seizure in a mammal comprising systemically administering to a mammal in need of treatment therefor a Benzothiazepine-compound in an amount effective to ameliorate said seizure, wherein the Benzothiazepine-compound is a benzothiazepine-type compound, or a pharmaceutically acceptable salt thereof, having calcium antagonist activity and which is represented by the following general formula:



(I)

wherein

Q is hydro (H) or halo;

R is H, Lower alkoxy, lower haloalkyl, cyano, lower alkyl or halo;

Y is

OR', wherein R' is H of alkylacyl, provided that then there is full saturation between carbons 2 & 3 of the benzothiazepine nucleus and 2,3-dihydro-functionality thereat as well, or

Cl, provided that then there is ethylenic unsaturation between positions 2 & 3 of the ebenzothiazepine nucleus, and

R'' is 2-[di(lower alkyl)amino]ethyl, 3-[di(lower alkyl-)amino]propyl, 2-(pyrrolidino)ethyl, 3-(pyrrolidino)propyl, 2-(piperidino)ethyl, 3-(piperidino)propyl, 2-(morpholino)ethyl, 3-(morpholino)propyl or (N-pyridinium)alkyl with a suitable counterion being present,

provided that, in the cis-configuration, when Q is H or 8-Cl, R is methoxy, R' is acetyl, and R'' is 2-(dimethylamino)-ethyl, then the compound is the levorotary isomer.

4,963,546

KETONE DERIVATIVES WHICH ARE ANTAGONISTS OF 5-HT AT 5-HT$_3$ RECEPTORS, COMPOSITIONS CONTAINING THEM, AND METHOD OF USE

Peter C. North; Alexander W. Oxford, both of Royston; David J. Cavalla, London, and David E. Bays, Ware, all of England, assignors to Glaxo Group Limited, London, England

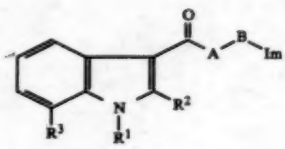
Filed Jan. 31, 1989, Ser. No. 304,269

Claims priority, application United Kingdom, Feb. 1, 1988, 8802127

Int. Cl.[5] A61K *31/415;* C07D *471/06, 487/06, 487/02*

U.S. Cl. 514—214 9 Claims

1. A compound of the formula (I):



(I)

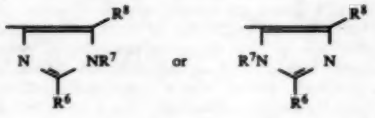
wherein

R^1 and R^3 together form a C_{2-4}alkylene chain and R^2 is a hydrogen atom;

A-B represents the group $R^4R^5C—CH_2$ or $R^4C═CH$;

R^4 and R^5, which may be the same or different, each represent a hydrogen atom or a C_{1-6}alkyl group; and

Im represents an imidazolyl group of formula:



wherein one of the groups represented by R^6, R^7 and R^8 is a hydrogen atom or a C_{1-6}alkyl, C_{3-7}cycloalkyl, C_{3-6}alkenyl, phenyl or phenylC_{1-3}alkyl group and each of the other two groups, which may be the same or different, represents a hydrogen atom or a C_{1-6}alkyl group;

or a physiologically acceptable salt or solvate thereof.

6. A method of treating a condition mediated through 5-HT$_3$ receptors which comprises administering to a patient an effective amount to relieve said condition of a compound of formula (I) as defined in claim 1 or a physiologically acceptable salt or solvate thereof.

4,963,547

ALPHA-ANDRENERGIC RECEPTOR ANTAGONISTS AND USE THEREAS

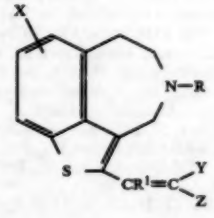
John J. Lafferty, Levittown; Robert M. Demarinis, Ardmore, and Dinubhai H. Shah, Norristown, all of Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 201,004, Jun. 1, 1988, abandoned. This application Jun. 6, 1989, Ser. No. 362,121

Int. Cl.[5] C07D *495/06;* A61K *31/38*

U.S. Cl. 514—217 16 Claims

1. A compound represented by the formula:



in which:

X is H, Cl, Br, F, I, CF_3, C_{1-6}alkyl, COR^{10}, CO_2R^{10}, $CONR^{16}R^{11}$, CN, NO_2, $NR^{12}R^{13}$, OR^{12}, SC_{1-4}alkyl, $S(CH_2)_{0-6}$aryl, SCF_3, or any accessible combination thereof of up to three substituents;

R is H, C_{1-6}alkyl, or C_{3-5}alkenyl;

R^1 is H or C_{1-6}alkyl;

R^{10} is C_{1-6}alkyl or $(CH_2)_{0-6}$aryl;

R^{11} and R^{16} independently are H, C_{1-6}alkyl, or $(CH_2)_{0-6}$aryl;

R^{12} is H, C_{1-6}alkyl, COR^{14}, or SO_2R^{15};

R^{13} is H or C_{1-6}alkyl;

R^{14} and R^{15} independently are C_{1-6}alkyl or $(CH_2)_{0-6}$aryl;

Y and Z independently are H, NO_2, C_{1-6}alkyl, CH_2CH_2OH, CN, CH_2OR^2, CH_2SR^2, COR^2, CO_2R^2, $CONR^3R^4$, $SO_2NR^3R^4$, SO_3R^2, SO_2R^5, SOR^5, $P(O)(OR^3)(OR^4)$, $P(O)R^5(OR^3)$, $P(O)R^5R^6$, $P(O)(OR^2)NR^3R^4$, $P(O)(NR^3R^4)_2$, $P(O)R^5(NR^3R^4)$, halo, CF_3, or $(CH_2)_{0-6}$aryl;

R^2, R^3, and R^4 independently are H, C_{1-6}alkyl, C_{3-5}alkenyl, or $(CH_2)_{0-6}$aryl; and

R^5 and R^6 independently are C_{1-6}alkyl, C_{3-5}alkenyl, or $(CH_2)_{0-6}$aryl; or a pharmaceutically acceptable salt thereof.

14. A method of treating benign prostatic hypertrophy in mammals that comprises administering to a subject in need thereof an effective amount of a compound of claim **1**.

15. A method of treating peripheral vascular disease in mammals that comprises administering to a subject in need thereof an effective amount of a compound of claim **1**.

16. A method of treating congestive heart failure in mammals that comprises administering to a subject in need thereof an effective amount of a compound of claim **1**.

4,963,548

(2-CYANO-2-OXIMINOACETYL)-AMINO ACID DERIVATIVES

Winfried Lunkenheimer, Wuppertal; Wilhelm Brandes, Leichlingen, and Gerd Hänssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

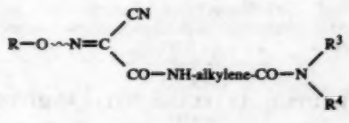
Filed May 27, 1988, Ser. No. 200,084

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1987, 3719227

Int. Cl.[5] A61K *31/275, 31/40, 31/44, 31/445*

U.S. Cl. 514—237.5 **8 Claims**

1. A (2-cyano-2-oximinoacetyl)-amino acid derivative of the formula



(I)

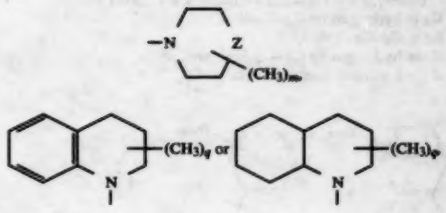
in which

R represents straight-chain or branched alkyl having 1 to 4 carbon atoms, straight-chain or branched cyano alkyl having 1 to 4 carbon atoms in the alkyl part, in each case straight-chain or branched alkenyl or alkinyl having 2 to 6 carbon atoms, cycloalkyl or cycloalkylalkyl each of which has 3 to 6 carbon atoms per cycloalkyl part and 1 to 4 carbon atoms in the straight-chain or branched part and each of which is optionally monosubstituted to pentasubstituted by identical or different alkyl having 1 to 4 carbon atoms, or represents benzyl or phenethyl, each of which is optionally monosubstituted to pentasubstituted by identical or different substituents, phenyl substituents in each case being halogen, alkyl or alkoxy in each case having 1 to 4 carbon atoms, halogenalkyl and halogenoalkoxy in each case having 1 to 2 carbon atoms and 2 to 5 identical or different halogen atoms;

alkylene represents a straight-chain or branched alkylene chain having 1 to 4 carbon atoms, and

(a) R^3 is H or alkyl having 1 to 4 carbon atoms, and R^4 is pyridyl, or

(b) R^3 and R^4 together with the nitrogen atom to which they are bound represent



where

Z represents oxygen or the CH_2 group,

m represents the numbers 2, 3 or 4,

p represents numbers 0, 1 or 2, and

q represents the numbers 1, 2 or 3.

6. A fungicidal composition comprising a fungicidally effective amount of a compound according to claim **1** and a diluent.

4,963,549

MEDICAMENT

Alan L. Rothaul; Lars M. Wood, and Robert W. Gristwood, all of SmithKline Beckman Corporation, Corporate Patents N-160, P.O. Box 7929, Philadelphia, Pa. 19101

Filed Sep. 27, 1988, Ser. No. 250,043

Claims priority, application United Kingdom, Sep. 28, 1987, 8722776

Int. Cl.[5] A61K *31/50*

U.S. Cl. 514—247 **1 Claim**

1. A method of treating ventricular fibrillation in a mammal suffering from same, which method comprises administering an effective amount of a pharmaceutical composition comprising 6-[4-(N^3-methyl-N^2-cyanoguanidino)phenyl]-5- methyl-4,5-dihdro-3(2H)-pyridazinone or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

4,963,550

SUBSTITUTED THIOUREAS, ISOTHIOUREAS AND CARBODIIMIDES AND USE AS PESTICIDE

Manfred Böger, Weil am Rhein; Jozef Drabek, Oberwil; Josef Ehrenfreund, Allschwil, and Odd Kristiansen, Möhlin, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

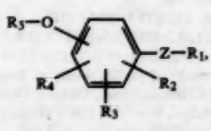
Division of Ser. No. 84,652, Aug. 12, 1987, Pat. No. 4,914,099. This application Feb. 7, 1990, Ser. No. 476,200

Claims priority, application Switzerland, Aug. 15, 1986, 3295/86

Int. Cl.[5] A01N *43/54, 43/58, 43/60;* **C07D** *239/80*

U.S. Cl. 514—249 **15 Claims**

1. A compound of formula I

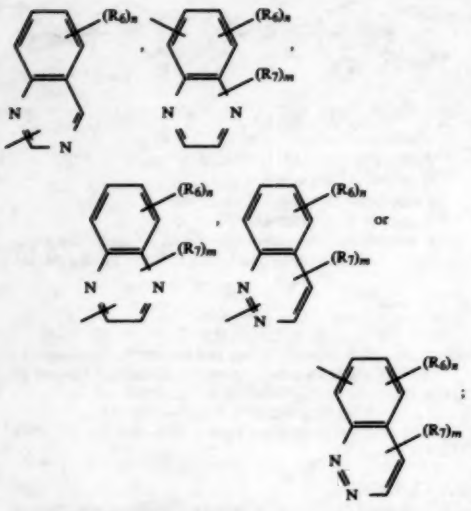


(I)

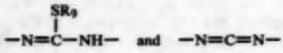
wherein

R_1 is C_1–C_{12}alkyl, C_3–C_8cycloalkyl, polycyclic alkyl containing a total of 7 to 10 carbon atoms, C_1–C_{12}alkyl which is substituted by 1 to 12 halogen atoms, C_1–C_4alkyl which is substituted by one or two C_3–C_6cycloalkyl radicals, alkoxyalkyl containing a total of 3 to 10 carbon atoms, C_1–C_5alkyl which is substituted by a phenyl radical, C_1–C_5alkyl which is substituted by a phenyl radical which is in turn substituted by one or two members selected from

the group consisting of halogen, methyl, methoxy and ethoxy; or is C_3–C_{10}alkenyl or C_3–C_{10}alkynyl,
R_2 is hydrogen or C_1–C_4alkyl,
R_3 is C_1–C_4alkyl,
R_4 is hydrogen or C_1–C_4alkyl, and
R_5 is a radical selected from



R_6 and R_7 are each independently of the other halogen, C_1–C_4alkyl, C_1C_3alkyl which is substituted by 1 to 7 halogen atoms, C_1–C_4alkoxy, C_1–C_3alkoxy which is substituted by 1 to 7 halogen atoms; or is phenyl,
R_8 is C_1–C_4alkyl,
R_9 is C_1–C_4alkyl or C_3–C_4alkenyl,
n is an integer from 0 to 3,
m is an integer from 0 to 2, and
Z is a group selected from



or a salt thereof.

12. A method of controlling insects or representatives of the order Acarina, which comprises treating said pests, their various development stages or the locus thereof, with a pesticidally effective amount of a compound of formula I according to claim 1 together with adjuvants and carriers suitable therefor.

4,963,551

STABLE LYOPHILIZED FORM OF (S)-(+)-BIS-4,4'-(1-METHYL-1,2-ETHANEDIYL)2,6-PIPERAZINEDIONE AND SOLUTIONS THEREOF

Nagesh R. Palepu, and Joyce W. Martin, both of Franklin County, Ohio, assignors to Erbamont Inc., Dublin, Ohio

Continuation of Ser. No. 136,036, Dec. 21, 1987, abandoned. This application Jan. 12, 1990, Ser. No. 463,844
Int. Cl.[5] A61K *31/495*
U.S. Cl. 514—252 **15 Claims**

1. A stable, rapidly soluble, lyophilized injectable composition containing up to about 6% moisture and capable of being stored at room temperature comprising the hydrochloric acid or sulfuric acid salt of (S)-31 (+)-bis-4,4'-(1-methyl-1,2-ethanediyl)2,6-piperazinedione or (R)−(−)-bis-4,4'-(1-methyl-1,2-ethanediyl)2,6-piperazinedione; wherein said lyophilized composition is prepared from a bulk solution comprising from about 25 mg/mL to about 40 mg/mL of said compound dissolved in hydrochloric or sulfuric acid; and wherein the pH of said bulk solution is from about 1.0 to about 2.0.

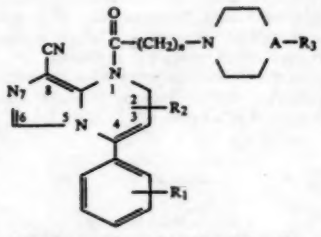
4,963,552

1-SUBSTITUTE-1,2-DIHYDRO-4-((SUBSTITUTED)-PHENYL)IMIDAZO-[1,5-A]PYRIMIDINE-8-CARBONITRILES

Shin S. Tseng, Bridgewater, N.J.; Herbert J. Brabander, Nanuet; Jannie S. Baker, White Plains, and Joseph W. Epstein, Monroe, all of N.Y., assignors to American Cyanamid Company, Wayne, N.J.

Filed Aug. 28, 1989, Ser. No. 399,097
Int. Cl.[5] A61K *31/495, 31/445;* C07D *487/06*
U.S. Cl. 514—253 **19 Claims**

1. A compound slelcted from those of the following formula:



wherein n is an integer from 1 to 4 inclusive; R_1 represents a mono- or disubstituent selected from the group consisting essentially of hydrogen, lower alkyl(C_1-C_3), lower alkoxy(C_1-C_3), halogen, nitro, cyano and trifluoromethyl; R_2 is hydrogen or lower alkyl(C_1-C_3); A is selected from the group consisting essentially of carbon, oxygen and nitrogen; with the proviso that when A is oxygen, R_3 cannot exist; when A is carbon, R_3 is selected from hydrogen or phenyl and when A is nitrogen, R_3 is selected from the group consisting essentially of phenyl, benzyl, (3-methoxyphenyl)methyl, (4-chlorophenyl)methyl, 3-phenoxypropyl, (4-chlorophenyl)-phenylmethyl, (2,6-dichlorophenyl-)methyl, 2-pyridinyl, 2-chlorophenyl, 4-chlorophenyl, 4-methoxyphenyl, 2-furanylcarbonyl, 3-furanylcarbonyl alkoxycarbonyl, where alkoxy is (C_1-C_3), 2-propynyl, bis(4-fluorophenyl)methyl, 2-cyclohexylethyl, 1-methylethyl and 4-fluorophenyl or the pharmacologically acceptable acid addition salts thereof.

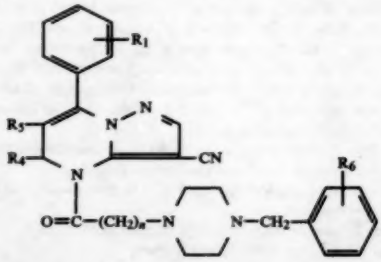
4,963,553

4-[(SUBSTITUTED) ALKYLCARBONYL]-4,5-DIHYDRO-AND
-4,5,6,7-TETRAHYDRO-7-[(SUBSTITUTED)PHENYL]-PYRAZOLO[1,5-A]PYRIMIDINES

Shin S. Tseng, Bridgewater, N.J.; Herbert J. Brabander, Nanuet, and Joseph W. Epstein, Monroe, both of N.Y., assignors to American Cyanamid Co., Stamford, Conn.

Continuation-in-part of Ser. No. 919,731, Oct. 16, 1986, abandoned. This application Aug. 29, 1988, Ser. No. 238,005
Int. Cl.[5] A61K *31/495;* C07D *487/04*
U.S. Cl. 514—258 **18 Claims**

1. A compound selected from those of the formula:



wherein n is an integer from 1 to 4 inclusive; R_1 represents a mono-or disubstituent of hydrogen, lower alkyl(C_1–C_3), lower alkoxy(C_1–C_3), halogen, nitro or trifluoromethyl; R_4 and R_5 are independently hydrogen or lower alkyl(C_1–C_3); and R_6 is hydrogen, lower alkyl(C_1–C_3), lower alkoxy(C_1–C_3), chloro, fluoro or trifluoromethyl and the pharmacologically acceptable salts thereof.

4,963,554

6,7-DIMETHOXY-1,2-DIHYDRO-2-ARYLQUINAZOLINE-3-OXIDES

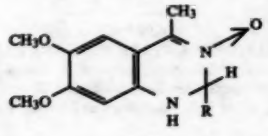
Donald W. Combs, Piscataway; Robert Falotico, Belle Mead, and David M. Ritchie, Princeton Junction, all of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Feb. 14, 1990, Ser. No. 479,796

Int. Cl.[5] A61K *31/505*; C07D *403/04*

U.S. Cl. 514—259 **12 Claims**

1. A compound of the formula



where

R is phenyl, substituted phenyl or heteroaryl;

wherein said substituted phenyl is substituted with halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, methylenedioxy, nitro, benzyloxy, amino or substituted amino, and said heteroaryl is furyl, thienyl, pyrrolo, N-substituted pyrrolo, pyridyl or substituted heteroaryl;

wherein said substituted amino is substituted with C_1–C_6 alkyl or C_1–C_6 dialkyl, said N-substituted pyrrolo is substituted with C_1–C_6 alkyl and said substituted heteroaryl is substituted with halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, methylenedioxy, nitro, benzyloxy, amino or substituted amino;

wherein said substituted amino is substituted with C_1–C_6 alkyl or C_1–C_6 dialkyl.

4,963,555

FORMULATIONS OF HETEROCYCLIC COMPOUNDS

Trevor M. Jones, Sanderstead, and Alan R. White, Meopham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 825,956, Feb. 4, 1986, abandoned, and a continuation of Ser. No. 279,861, Jul. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 202,339, Oct. 30, 1980, abandoned. This application Mar. 1, 1989, Ser. No. 317,129

Claims priority, application United Kingdom, Jul. 18, 1980, 8023645

Int. Cl.[5] A61K *31/52*

U.S. Cl. 514—262 **15 Claims**

1. An oil-in-water topical formulation of an effective antiviral non-toxic amount of 9-(2-hydroxyethoxymethyl)guanine or a pharmaceutically acceptable salt thereof, having a dispersed oil phase and a continuous aqueous phase, said aqueous phase containing therein water, 30% to 50% w/w of a water miscible polyhydvic alcohol, and an effective antiviral non-toxic amount solubilised 9-(2-hydroxyethoxymethyl)guanine or said salt thereof.

4,963,556

CHOLINE ESTERS AS ABSORPTION-ENHANCING AGENTS FOR DRUG DELIVERY THROUGH MUCOUS MEMBRANES OF THE NASAL, BUCCAL, SUBLINGUAL AND VAGINAL CAVITIES

Jose Alexander; Joseph A. Fix, and A. J. Repta, all of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 50,643, May 18, 1987, Pat. No. 4,835,138, which is a division of Ser. No. 766,377, Aug. 16, 1985, Pat. No. 4,692,441. This application Apr. 20, 1989, Ser. No. 340,840

Int. Cl.[5] A61K *31/52, 31/70*

U.S. Cl. 514—262 **10 Claims**

1. A pharmaceutical composition for enhancing nasal, buccal, sublingual and vaginal absorption of a formulation comprising a therapeutically effective dosage amount of an antiviral drug and a choline ester absorption enhancing agent of the formula:

$$[(CH_3)_3N^+CH_2CH_2OR]X^-$$

wherein R is saturated acyl (C_2–C_{20}), acyl (C_2–C_{20}) with 1 to 6 double bonds, hydroxyacyl (C_2–C_{20}) with 1 to 3 hydroxy groups, ketoacyl (C_4–C_{20}), unsaturated hydroxyacyl (C_5–C_{20}), alkylaroyl (C_7–C_{20}) arylacyl (C_7–C_{20}), alkylaroyl (C_7–C_{20}) or carbalkoxyacyl (C_5–C_{20}) and X is a pharmaceutically acceptable counterion.

4,963,557

IMMUNOMODULATORY AZASPIRANES

Alison M. Badger, Bryn Mawr; Elaine N. Cheeseman, Phoenixville; Michael J. DiMartino, Philadelphia; James W. Dorman, West Chester; Christopher K. Mirabelli, Exton; Donald H. Picker, Merion, and David A. Schwartz, Exton, all of Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

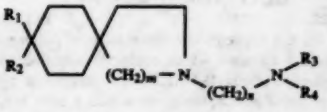
Continuation-in-part of Ser. No. 101,704, Sep. 28, 1987, abandoned. This application Sep. 13, 1988, Ser. No. 244,229

Int. Cl.[5] C07D *213/00*

U.S. Cl. 514—278 **39 Claims**

1. A compound of the formula:

Formula (IA)



wherein:

n is 3–7;

m is 1 or 2;

R_1 and R_2 are the same or different and are selected from hydrogen or straight chain, branched chain or cyclic alkyl, provided that the total number of carbon atoms contained by R_1 and R_2 when taken together is 5–10; or R_1 and R_2 are joined together to form a cyclic alkyl group having 3–7 carbon atoms;

R_3 and R_4 are the same or different and are selected from hydrogen or straight chain alkyl having 1–3 carbon atoms; or R_3 and R_4 are joined together to form a cyclic alkyl group having 4–7 carbon atoms;

or a pharmaceutically acceptable salt or hydrate or solvate thereof.

4,963,558

PYRAZOLO-[3,4-G]ISOQUINOLINE DERIVATIVES USEFUL TO TREAT CNS DISORDERS

Terrence M. Hotten, Farnborough Hants; Graham H. Timms, Surrey, and David E. Tupper, Berks, all of England, assignors to Lilly Industries Limited, Basingstoke, England

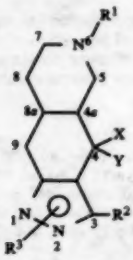
Filed Dec. 7, 1989, Ser. No. 447,319

Claims priority, application United Kingdom, Dec. 8, 1988, 8828669

Int. Cl.[5] A61K *31/47*; C07D *489/04*

U.S. Cl. 514—293 7 Claims

1. A compound of the formula



(I)

in which R^1 is hydrogen or C_{1-6} alkyl, R^2 is hydrogen, C_{1-6} alkyl optionally substituted by C_{3-9} cycloalkyl or optionally substituted phenyl, C_{3-9} cycloalkyl, optionally substituted phenyl, or $—SR^4$ where R^4 is C_{1-6} alkyl optionally substituted by C_{3-9} cycloalkyl or optionally substituted phenyl, or C_{3-9} cycloalkyl, R^3 is hydrogen, C_{1-6} alkyl optionally substituted by C_{3-9} cycloalkyl or optionally substituted phenyl, C_{3-9} cycloalkyl, or optionally substituted phenyl, and either X and Y are both hydrogen or together are =O; or a pharmaceutically-acceptable acid addition salt thereof.

7. A method of treating an animal suffering from a disorder of the central nervous system, which comprises administering an effective amount of a compound of formula (I) as defined in claim 1, or a pharmaceutically-acceptable salt thereof.

4,963,559

METHOD OF TREATING CANCER AND CANCER METASTASIS

Tadao Suzuki, Tokyo, Japan, assignor to Sanofi, Paris, France

Continuation of Ser. No. 972,819, Dec. 26, 1978, abandoned. This application Oct. 27, 1982, Ser. No. 436,969

Claims priority, application Japan, Jan. 6, 1978, 53-465

Int. Cl.[5] A61K *31/44*

U.S. Cl. 514—301 19 Claims

1. A method for the prevention or treatment of pulmonary tumor metastasis in a mammal which comprises administering to a mammal 5-(2-chlorobenzyl)-4,5,6,7-tetrahydrothieno pyridine or its therapeutically acceptable acid addition salts, which compound being administered in an effective amount thereof.

4,963,560

1,4-DIHYDROPYRIDINE DERIVATIVES

Kelvin Cooper; Michael J. Fray; Kenneth Richardson, and John Steele, all of Deal, England, assignors to Pfizer Inc., New York, N.Y.

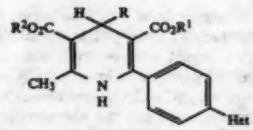
Filed Sep. 12, 1989, Ser. No. 406,220

Claims priority, application United Kingdom, Sep. 21, 1988, 8822170

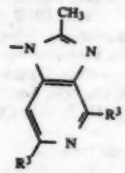
Int. Cl.[5] C07D *471/04*; A61K *31/455*

U.S. Cl. 514—303 6 Claims

1. A compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein R is chlorophenyl or bromophenyl; R^1 is alkyl having one to four carbon atoms; R^2 is hydrogen, benzyl, cycloalkyl having five to seven carbon atoms or alkyl having one to four carbon atoms optionally substituted by cyano, trimethylsilyl or alkoxy having one to three carbon atoms, and Het is a group of the formula



wherein R^3 is hydrogen or methyl.

4,963,561

IMIDAZOPYRIDINES, THEIR PREPARATION AND USE

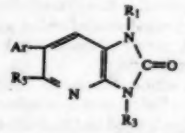
George Y. Lesher, Schodack; Edward R. Bacon, East Greenbush; Baldev Singh, East Greenbush, and Gee-Hong Kuo, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Feb. 28, 1990, Ser. No. 486,637

Int. Cl.[5] C07D *471/04, 401/14*; A61K *31/47, 31/44*

U.S. Cl. 514—303 22 Claims

1. A compound of the formula



wherein R_1 and R_3 are hydrogen or lower-alkyl;

R_5 is lower-alkyl or fluorinated-lower-alkyl; and Ar is 4-or 3-pyridinyl, 4-or 6-quinolinyl, 4-pyrimidinyl, phenyl, or phenyl substituted in the 4-position by OH, NO_2, NH_2, NH(lower-alkyl), N(lower-alkyl)$_2$, $NHSO_2$-(alkyl of 1–8 carbons), NH-SO_2-(phenyl or lower-alkylphenyl), NH-SO_2-(fluorinated lower-alkyl), NH-$SO_2(CH_2)$hd 4N(loweralkyl)$_2$, NH-SO_2-(8-quinolinyl), NHCO-lower-alkyl, NHCO(fluorinated lower-alkyl) or NHCONH-lower-alkyl; or in the 4- and 3-positions by OH and NO_2 or OH and NH_2, respectively;

or a pharmaceutically acceptable acid-addition salt thereof; with the proviso that when R_5 is unsubstituted loweralkyl, Ar is other than 4-or 3-pyridinyl.

19. A composition for effecting phosphodiesterase inhibition in a mammalian organism, which comprises an effective amount of a compound according to claim 1 in admixture with a suitable carrier or diluent.

4,963,562

NITROGEN CONTAINING HETEROCYCLIC COMPOUNDS

Karl W. Franzmann, Beckenham, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 61,599, Jun. 18, 1987, abandoned, which is a continuation of Ser. No. 758,097, Jul. 23, 1985, abandoned. This application Dec. 2, 1988, Ser. No. 282,992

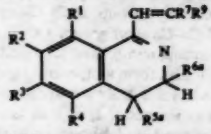
Claims priority, application United Kingdom, Aug. 1, 1984, 8419658

Int. Cl.[5] A61K *31/47*

U.S. Cl. 514—307 2 Claims

1. A method of treating a fungal infection in a fungi infected human, animal or plant which comprises administering to said

fungi infected human, animal or plant an effective antifungal treatment amount of compound of the formula (IIIA):



or salt thereof useful for treatment of a human, animal or plant, wherein R^1 is hydrogen, or a substituent chosen from fluorine, chlorine, methoxy, methyl, trifluoromethyl or methylthio; R^2, R^3 and R^4 are the same or different and each is hydrogen or a substituent group of the formual R^{10}—A— wherein R^{10} is hydrogen or C_{1-16} hydrocarbyl optionally substituted by halogen, fluorosulphonyl, cyano, hydroxy, thio, nitro, C_{1-3} alkoxy or C_{1-3} alkylthio wherein the alkoxy and alkylthio groups are optionally further substituted by halogen, hydroxy, thio, C_{1-2} alkoxy or C_{1-2} alkylthio, and A is oxygen, sulphur or methylene; R^{5a} is hydrogen, C_{1-4} alkyl or C_{1-12} hydrocarbyl; R^{6a} is hydrogen or C_{1-12} is hydrocarbyl; R^7 is hydrogen or fluorine; R^9 is a group $—(CH{=}CH)_nR^{11}$ wherein n is 0–2; R^{11} is hydrogen, C_{1-8} alkyl, C_{2-8} alkenyl, C_{2-8} alkynyl or a carbocyclic monocyclic or carbocyclic bicyclic ring system having three to ten ring members, optionally substituted by hydroxy, thio, halogen, fluorosulphonyl, nitro, cyano, C_{1-12} hydrocarbyloxy and hydrocarbylthio wherein the said hydrocarbyl, hydrocarbyloxy and hydrocarbylthio group are each optionally further substituted by halogen, hydroxy, thio, C_{1-2} alkylthio or C_{1-2} alkoxy.

4,963,563

6-SUBSTITUTED-1,2,3,4-TETRAHYDROISOQUINOLINES

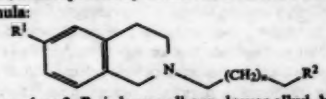
John F. DeBernardis, Lindenhurst, and Robert E. Zelle, Grayslake, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Oct. 13, 1989, Ser. No. 421,213

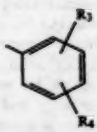
Int. Cl.[5] A61K *31/47*; C07D *409/06*

U.S. Cl. 514—307 **7 Claims**

5. A method for selectively inhibiting alpha-2-adrenergic receptors comprising administering to a patient in need of such treatment, a therapeutically effective amount of a compound of the formula:



wherein n = 1 or 2; R_1 is lower alkoxy, lower alkyl, halo, ester, carbamate, or substituted amino; and R_2 is thienyl or furyl; or R_2 is



wherein R_3 and R_4 are independently selected from hydrogen, halo, and methoxy; and pharmaceutically acceptable salts thereof.

4,963,564

PHENETHANOLAMINE DERIVATIVES

Ian F. Skidmore, Welwyn; Alan Nayler, Royston; Harry Finch, Letchworth; Lawrence H. C. Lunts, Broxbourne, and Ian B. Campbell, Dane End, all of England, assignors to Glaxo Group Ltd., London, England

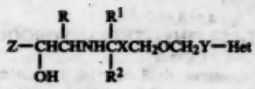
Filed Aug. 10, 1988, Ser. No. 230,359

Claims priority, application United Kingdom, Aug. 11, 1987, 8718940

Int. Cl.[5] C07D *213/36, 215/14*; A61K *31/44, 31/47*

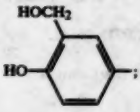
U.S. Cl. 514—311 **4 Claims**

1. A compound of the formula (I)

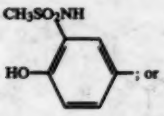


(I)

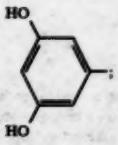
and physiologically acceptable salts and hydrates thereof, wherein Z represents the group



(a)



(b)



(c)

X represents a C_{1-7} alkylene chain, and Y represents a C_{1-6} alkylene chain with the proviso that the sum total of carbon atoms in the chains X and Y is between 5 and 10;

R represents a hydrogen atom;

R^1 and R^2 each represent a hydrogen atom; and

Het represents a quinolyl or pyridyl group, and the group Het may optionally be substituted by a hydroxy group.

4. A pharmeceutical composition for therapy or prophylaxis of a disease associated with reversible airways obstruction such as asthma or chronic bronchitis, which comprises an effective amount of alleviate said disease of at least one compound of formula (I) as defined in claim 1 or a physiologically acceptable salt or hydrate thereof, together with a physiologically acceptable carrier or excipient.

4,963,565

IN VIVO TREATMENT OF MYCOBACTERIAL INFECTIONS WITH 6-CYCLO OCTYLAMINO-5,8-QUINOLINE QUINONE

Pattisapu R. J. Gangadharam, Denver, Colo., assignor to National Jewish Center for Immunology and Respiratory Medicine, Denver, Colo.

Filed Jul. 30, 1986, Ser. No. 890,720

Int. Cl.[5] A61K *31/47*

U.S. Cl. 514—311 **12 Claims**

1. A method of treating tuberculosis in mammals comprising administering to an individual infected with tuberculosis causing bacteria an effective amount of 6-cyclo-octylamino-5,8-quinoline quinone sufficient to inhibit said tuberculosis causing bacteria and infections arising therefrom.

4,963,566

BENZIMIDAZOLYL-SULFINYL-TETRAHYDROQUINOLINES

Minoru Uchida, Komatsusima; Seiji Morita, Tokushima, and Masatoshi Chihiro, Naruto, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

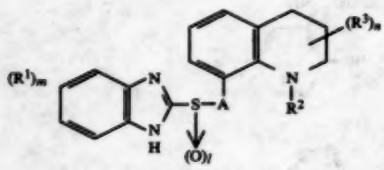
Filed Mar. 27, 1987, Ser. No. 31,037

Claims priority, application Japan, Mar. 28, 1986, 61-72322; Jun. 4, 1986, 61-129567; Aug. 1, 1986, 61-182377; Sep. 24, 1986, 61-225137; Dec. 24, 1986, 61-313662

Int. Cl.[5] A61K *31/47*; C07D *401/12*

U.S. Cl. 514—312 20 Claims

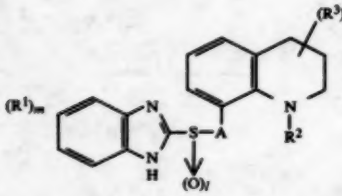
1. A hydroquinoline compound of the formula:



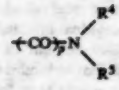
wherein A is a methylene group; R^1 is a hydrogen atom, a C_1–C_6 alkyl group, a C_1–C_6 alkoxy group, a halogen atom or a C_1–C_6 alkanoyl group; R_2 is a C_2–C_6 alkenyl group; R^3 is a C_1–C_6 alkyl group, a C_1–C_6 alkoxy group, or a group of the formula:

wherein R^4 and R^5 are, the same or different, a hydrogen atom or a C_1–C_6 alkyl group; m is an integer of 1 or 2; n and l are integers of 1; and the bond between the 3- and 4-positions of the quinoline skeleton is a single bond; or its pharmaceutically acceptable salt.

3. A hydroquinoline compound of the formula:



wherein A is a methylene group; n is an integer of 1 or 2; R^1 is a hydrogen atom, a C_1–C_6 alkyl group, a C_1–C_6 alkoxy group, a halogen atom or a C_1–C_6 alkanoyl group; R^2 is a C_1–C_6 alkyl group; and when n is 1, R^3 is a hydrogen group, a C_2–C_6 alkenyloxy group, a C_1–C_4 alkylenedioxy group, a C_1–C_6 alkylidene group, a hydroxy-substituted C_1–C_6 alkyl group, or a group of the formula:



wherein p is an integer of 0 to 1; R^4 and R^5 are, the same or different, a hydrogen atom, a C_1–C_6 alkyl group, a hydroxy-substituted C_1–C_6 alkyl group, a C_3–C_8 cycloalkyl group, a C_3–C_8 cyloalkyl-C_1–C_6 alkyl group, a C_2–C_6 alkenyl group, a C_1–C_6 alkanoyl group, and R^4 and R^5 together with the bonding nitrogen atom may form a piperidino group or a pyrrolidinyl group, and when n is 2, R^3 is a hydroxy group or a C_1–C_6 alkyl group; l is an integer of 1; m is an integer of 1 or 2; and the bond between the 3- and 4-positions of the quinoline skeleton is a single bond; provided that R^4 and R^5 cannot both be a hydrogen atom or both be a C_1–C_6 alkyl group or one cannot be a hydrogen atom and the other a C_1–C_6 alkyl group or a C_1–C_6 alkanoyl group; or its pharmaceutically acceptable salt.

4,963,567

8-AMINO DECAHYDROQUINOLINES AND MEDICINAL USE THEREOF

Francois Clemence; Odile Le Martret, both of Paris; Francoise Delevallee, Fontenay sous Bois, and Michel Fortin, Paris, all of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 84,456, Aug. 12, 1987, Pat. No. 4,877,796.

This application Jun. 27, 1989, Ser. No. 371,995

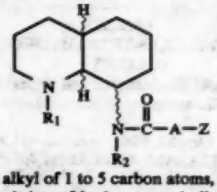
Claims priority, application France, Aug. 12, 1986, 86 116204; Jul. 9, 1987, 87 09747

Int. Cl.[5] C07D *403/12, 407/12, 409/12*; A61K *31/47*

U.S. Cl. 514—314 16 Claims

1. A compound selected from the group consisting of all enantiomeric and diastereoisomeric forms of a decahydroquinoline of the formula

I



wherein R_1 is alkyl of 1 to 5 carbon atoms, R_2 is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, A is selected from the group consisting of —(CH-2)—$_n$—, —CH_2O— and alkylene substituted with alkyl having a total of 2 to 8 carbon atoms, n is an integer from 0 to 5, Z is selected from the group consisting of unsubstituted or substituted naphthyl, unsubstituted or substituted indenyl, unsubstituted or substituted heteromonocycle selected from the group consisting of thiazolyl, pyridinyl, oxazolyl, isoxazolyl, imidazolyl and thienyl and unsubstituted or substituted heterobicycle selected from the group consisting of indolyl, quinolyl, benzothienyl, benzimidazolyl, benzoxazolyl and benzothiazolyl, the said substituents being selected from the group consisting of alkyl and alkoxy of 1 to 5 carbon atoms, —CF_3, —NO_2, —NH_2, mono- and dialkylamino of 1 to 5 carbon atoms and phenyl unsubstituted or substituted with one or more members of the group consisting of alkyl and alkoxy of 1 to 5 carbon atoms and halogen and their non-toxic, pharmaceutically acceptable acid addition salts and their quaternary ammonium salts with R-Y wherein R is alkyl of 1 to 4 carbon atoms and Y is a halogen.

11. A method of inducing central analgesic activity in warm-blooded animals comprising administering to warm-blooded animals a central analgesically effective amount of at least one compound of claim 1.

15. A method of inducing diuresis activity in warm blooded animals comprising administering to warm-blooded animals a diuretically effective amount of at least one compound of claim 1.

16. A method of treating arrithmia in warm blooded animals comprising administering to warm-blooded animals an antiarrithmically effective amount of at least one compound of claim 1.

4,963,568
DOPAMINE AGONISTS

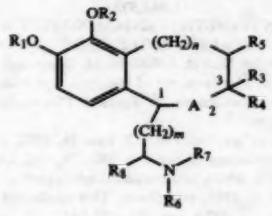
Robert W. Schoenleber, Deerfield; John W. Kebabian, Lake Bluff; Yvonne C. Martin, Waukegan; Michael P. DeNinno, Wildwood; Richard J. Perner, Gurnee; David M. Stout, Mettawa; Chi-Nung W. Hsiao, Libertyville; Stanley DiDomenico, Jr., Ingleside; John F. DeBernardis, Lindenhurst; Fatima Z. Basha, Lake Forest; Michael D. Meyer, Lindenhurst, and Biswanath De, Vernon Hills, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed May 31, 1989, Ser. No. 359,448

Int. Cl.[5] C07D *311/04, 405/06;* C07C *211/03;* A61K *31/35*

U.S. Cl. 514—320 8 Claims

1. A compound having the formula:



wherein

A is O, CH, or CH_2;

R_1 and R_2 are the same and are selected from hydrogen or a acyl or cyclic borate leaving group or a protecting group selected from alkyl, alkenyl, cyclopropylmethyl, cyclohexyl, aryl, or cyclohexylidenyl

m is zero or 1 and n is zero;

R_3 is alkyl, substituted alkyl, carbocyclic aryl, cycloalkyl, or taken together with R_4 can form a spiroalkyl; R4 is H or alkyl, or taken together with R_3 can form a spiroalkyl;

R_5 is H or alkyl, or can be taken together with R_3 to form a fused cycloalkyl;

R_6 is H, alkyl, or substituted alkyl, or taken together with R8 can form an N containing saturated heterocyclic ring having 5–6 ring members

R_7 is H, alkyl, alkenyl, cycloalkyl, or carbocyclic arylalkyl wherein the alkyl contains from one to twelve carbon atoms;

with the proviso that when R_6 is alkyl R_7 cannot be carbocyclic arylalkyl;

R_8 is H, alkyl;

wherein alkyl is of from one to twelve carbon atoms; alkenyl is of from one to twelve carbon atoms; cycloalkyl is of from of from three to twelve carbon atoms; substituted alkyl is alkyl as previously defined substituted with a group selected from cycloalkyl, hydroxy, amino, (lower alkyl) amino, carbocyclic aryl, carbocyclic aryloxy, pyrrolidino, piperidino, and morpholino; or a pharmaceutically acceptable salt, ester or amide thereof.

3. A method of treating neurological disorders characterized by abnormal dopamine levels comprising administering to a patient in need a therapeutically effective amount of a compound as defined in claim 1.

4,963,569
L-654,040, ANTIBACTERIAL AGENT

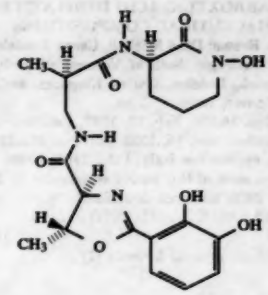
Sara A. Currie, Roselle; Thomas W. Miller, Carteret; Eugene L. Dulaney, Summit; James P. Springer, Mountainside; Mary E. Valiant, Plainfield, all of N.J.; Segrario Mochales del Val, Madrid, Spain, and Sheldon B. Zimmerman, Springfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 164,707, Mar. 7, 1988, abandoned. This application Jun. 9, 1989, Ser. No. 364,744

Int. Cl.[5] A61K *31/445;* C07D *411/12*

U.S. Cl. 514—326 2 Claims

1. A compound of the Formula:



I

or a pharmaceutically acceptable salt, hydrate, ester, anhydride or amide thereof.

2. An antibacterial composition comprising an antibacterially effective amount of a compound of claim 1 and a pharmaceutical acceptable carrier.

4,963,570
1-(ACETYLAMINOPHENYL)-2-AMINOPROPANONE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS THEREOF

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons Alfort, France

Continuation-in-part of Ser. No. 38,981, Apr. 16, 1987, Pat. No. 4,877,812, which is a continuation-in-part of Ser. No. 660,285, Oct. 12, 1984, abandoned. This application Jul. 7, 1989, Ser. No. 376,635

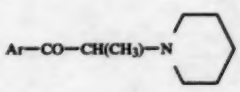
Claims priority, application France, Oct. 14, 1983, 83 16408; Aug. 20, 1984, 84 12963

Int. Cl.[5] A61K *31/445;* C07D *211/06*

U.S. Cl. 514—331 4 Claims

1. A 1-(acetylaminophenyl)-2-piperidinopropanone derivative which is selected form the group consisting of

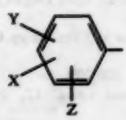
(a) the compounds of the formula



(I)

in which

Ar represents an acetylaminophenyl group of the formula



in which X is 3—CH_3CONH or 4—CH_3CONH and Y and Z each represent a hydrogen atom; and

(b) their addition salts.

4. A central nervous system antidepressant composition comprising an effective amount of at least one 1-(acetylaminophenyl)-2-aminopropanone derivative as claimed in claim 1 or one of its non-toxic addition salts, and, a physiologically acceptable excipient.

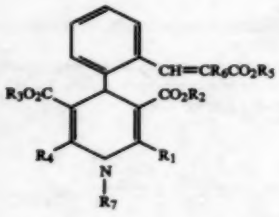
4,963,571

PYRIDINEDICARBOXYLIC ACID DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS

Claudio Semeraro, Bremo; Dino Michell, Carpi; Daniele Pierraccioli; Giovanni Gavizaghi, both of Verona, all of Italy, and Alan D. Borthwick, London, United Kingdom, assignors to Glaxo S.p.A., Verona, Italy

Division of Ser. No. 16,590, Feb. 19, 1987, Pat. No. 480,653.
This application Nov. 16, 1988, Ser. No. 272,226
Claims priority, application Italy, Feb., 1986, 19486 A/86
The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.
Int. Cl.[5] A61K *31/455*; C07D *211/90*
U.S. Cl. 514—356 19 Claims

1. Compound of the general formula (I)



(I)

in which

R_1 and R_4 independently represent a C_{1-4} alkyl group;

R_2 and R_3 independently represent C_{1-6} straight or branched chain alkyl or alkoxyalkyl group;

R_5 represents a C_{1-13} straight or branched chain alkyl group or a C_{5-8} cycloalkyl group may be substituted by a C_{1-3} alkyl group;

R_6 represents a hydrogen or halogen atom or a straight or branched C_{1-3} alkyl group; and

R_7 represents a C_{1-4} alkyl group optionally substituted by hydroxy or C_{1-3} alkoxy or trifluoromethyl or R_7 represents a phenyl C_{1-2} alkyl group in which the phenyl portion is optionally substituted by 1 to 3 C_{1-3} alkyl or C_{1-3} alkoxy groups or halogen atoms.

18. Pharmaceutical compositions comprising a compound as claimed in claim 1 in association with a pharmaceutically acceptable carrier or diluent.

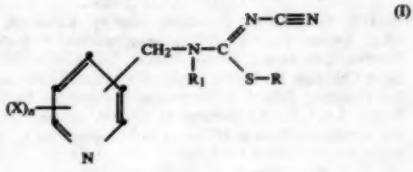
4,963,572

N-PYRIDYL METHYL-N'-CYANOISOTHIOUREA COMPOUNDS USEFUL IN CONTROLLING INSECT PESTS

Laurenz Gsell, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 8, 1988, Ser. No. 229,209
Claims priority, application Switzerland, Aug. 12, 1987, 3099/87
The portion of the term of this patent subsequent to Oct. 16, 2007, has been disclaimed.
Int. Cl.[5] A61K *31/44*
U.S. Cl. 514—357 10 Claims

9. A method of controlling destructive insects and representatives of the order Acarina, wherein the pests or their various stages of development or their loci are brought into contact with or treated with a pesticidally effective amount of a compound of formula I



(I)

wherein R is C_1–C_4alkyl, cyclopropyl or benzyl, R_1 is C_1–C_4alkyl or cyclopropyl, X is halogen and n is 0, 1, 2 or 3.

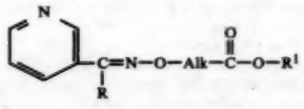
4,963,573

[[(3-PYRIDINYL)METHYLEN]AMINO]OXY]ALKANOIC ACIDS AND ESTERS

Eddy J. E. Freyne, Rumst; Alfons H. M. Raeymaekers, Beerse; Victor Sipido, Merksem, all of Belgium, and Marc G. Venet, Paris, France, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation of Ser. No. 156,513, Feb. 16, 1988, abandoned, which is a continuation of Ser. No. 888,670, Jul. 23, 1986, Pat. No. 4,746,671, which is a continuation-in-part of Ser. No. 794,999, Nov. 4, 1985, abandoned. This application May 23, 1989, Ser. No. 356,592
Int. Cl.[5] A61K *31/44*; C07D *213/53*
U.S. Cl. 514—357 36 Claims

1. A chemical compound having the following formula (I):



(I)

a N-oxide form, a pharmaceutically acceptable acid-addition, metal or amine substitution salt, or a stereochemically isomeric form thereof, wherein:

R is hydrogen, C_{1-10}alkyl, trifluoromethyl, Ar or Ar(C_{1-10}alkyl); wherein Ar is phenyl, naphthalenyl, pyridinyl, pyrimidinyl, furanyl or thienyl, said phenyl and naphthalenyl are each optionally substituted with up to 3 substituents being each independently C_{1-6}alkyl, C_{1-6}alkyloxy, mono- and di(C_{1-6}alkyloxy)methyl, amino, C_{1-6}alkylcarbonylamino, carboxyl, formyl, halo, hydroxy, nitro or trifluoromethyl;

R^1 is hydrogen or C_{1-6} alkyl; and

Alk is a C_{2-10} alkanediyl radical;

provided that the [[(3-pyridinyl)methylen]amino]oxy radical and the —$COOR^1$ radical are not bound to the same carbon atom.

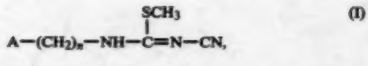
4,963,574

N-CYANOISOTHIOUREA COMPOUNDS USEFUL IN PEST CONTROL

Markus Bachmann, Sissein; Laurenz Gsell, Basle, and Hanspeter Fischer, Bottmingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 16, 1988, Ser. No. 156,113
Claims priority, application Switzerland, Feb. 24, 1987, 687/87
The portion of the term of this patent subsequent to Oct. 16, 2007, has been disclaimed.
Int. Cl.[5] A61K *31/44*, *31/34*
U.S. Cl. 514—357 6 Claims

1. A method of controlling pests selected from insects and plant-destructive nematodes, which comprises contacting or treating said pests, their different development stages or the locus thereof, with a pesticidally effective amount of a compound of formula I



(I)

wherein A is a pyridyl, furanyl, indolyl or pyrrolyl ring, and n is 1 or 2, or with a composition which contains a pesticidally effective amount of said compound, together with adjuvants and carriers therefor.

4,963,575

DERIVATIVES OF N-PHENYLPYRAZOLES, COMPOSITIONS AND USE

Ian G. Buntain; Leslie R. Hatton, both of Chelmsford; David W. Hawkins, Upminster; Christopher J. Pearson, Hertford, and David A. Roberts, Mill Hill, all of England, assignors to May & Baker Ltd., Dagenham, England

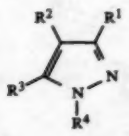
Filed Jul. 14, 1989, Ser. No. 379,982

Claims priority, application United Kingdom, Jul. 15, 1988, 8816915

Int. Cl.[5] A01N *43/56, 43/647, 43/653;* **C07D** *403/04*

U.S. Cl. 514—359 **9 Claims**

1. An N-phenylpyrazole derivative of the formula:



(I)

wherein R^1 represents a cyano group, R^2 represents a group R^5SO_2, R^5SO, or R^5S in which R^5 represents a straight- or branched-chain alkyl, alkenyl or alkynyl group containing up to 4 carbon atoms which may be unsubstituted or substituted by one or more halogen atoms which may be the same or different; R^3 represents a group Het selected from pyrrol-1-yl, pyrazol-1-yl, imidazol-1-yl, 1,2,4-triazol-4-yl, 1,2,4-triazol-1-yl, 1,2,3-triazol-1-yl, 1,2,3-triazol-2-yl; and R^4 represents a phenyl group substituted in the 2-position by a fluorine, chlorine, bromine or iodine atom; in the 4-position by a straight- or branched-chain alkyl or alkoxy group containing from 1 to 4 carbon atoms which may be unsubstituted or substituted by one or more halogen atoms which may be the same or different, or a fluorine, chlorine, bromine or iodine atom; and unsubstituted or substituted in the 6-position by a fluorine, chlorine, bromine or iodine atom, or when R^3 is a substituted or unsubstituted imidazole heterocyclic group, a pesticidally-acceptable acid addition salt thereof.

8. An arthropodicidal, plant nematocidal, anthelmintic or anti-protozoal composition which comprises an N-phenylpyrazole derivative according to claim 1 or a pesticidally acceptable acid addition salt thereof in association with one or more compatible diluents or carriers.

4,963,576

DITHIOACETAL COMPOUNDS, PROCESSES FOR PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Teruo Oku; Yoshio Kawai; Hiroshi Kayakiri; Kazuyoshi Kuratani, and Masashi Hashimoto, all of Tsukuba, Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

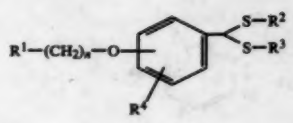
Filed May 6, 1988, Ser. No. 191,253

Claims priority, application United Kingdom, May 19, 1987, 8711802

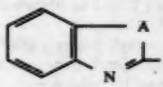
Int. Cl.[5] A61K *31/415, 31/420, 31/425;* **C07D** *277/62*

U.S. Cl. 514—367 **11 Claims**

1. A dithioacetal compound of the formula:



wherein R^1 is a heterocyclic group of the formula



wherein A is

—O— or —S—, which may have one or more substituents selected from halogen, lower alkyl, lower alkoxy and phenyl, R^2 and R^3 are each lower alkyl, aryl or ar-(lower)alkyl, or R^2 and R^3 are together to form 1,3-dithian ring, R^4 is hydrogen or lower alkoxy, and n is 0 or an integer 1 to 4 and pharmaceutically acceptable salts thereof.

11. An antiinflammatory agent or antiallergic agent comprising as an active ingredient a compound as defined in claim 1 or its pharmaceutically acceptable salt.

4,963,577

USE OF THE THIAZOLE DERIVATIVE TIPROTIMOD FOR THE PREPARATION OF AN AGENT FOR THE THERAPY OF VIRUS INFECTIONS

Hans U. Schorlemmer; Hans H. Sedlacek, and Joachim Hilfenhaus, all of Marburg, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg/Lahn, Fed. Rep. of Germany

Filed May 12, 1989, Ser. No. 350,957

Claims priority, application Fed. Rep. of Germany, May 16, 1988, 3816603

Int. Cl.[5] A61K *31/425*

U.S. Cl. 514—369 **4 Claims**

1. A method for the therapy of viral infectious diseases consisting essentially of administering to a host in need of such therapy an effective amount of the compound 2-(3-carboxy-1-propylthio)-4-methyl-1,3-thoazol-5-ylacetic acid or a physiologically tolerated salt thereof.

4,963,578

ORGANIC COMPOUNDS AND THEIR PHARMACEUTICAL USE

Stephen R. Baker, Indianapolis, Ind.; William B. Jamieson, deceased, late of Horsella (National Westminster Bank, Farnham Trustee and Investment Bank, executors), and Alec Todd, Wokingham, both of England, assignors to Lilly Industries Limited, London, England

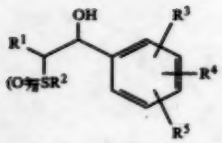
Continuation of Ser. No. 15,822, Feb. 17, 1987, abandoned, which is a division of Ser. No. 635,863, Jul. 30, 1984, Pat. No. 4,665,189. This application Nov. 1, 1989, Ser. No. 430,105

Claims priority, application United Kingdom, Aug. 3, 1983, 8320943

Int. Cl.[5] C07D *257/04;* **A61K** *31/41, 31/95;* **C07C** *149/267, 147/00*

U.S. Cl. 514—381 **6 Claims**

1. A compound of the formula



(I)

wherein n is 0, 1, or 2; R^1 is an optionally unsaturated hydrocarbyl group containing from 5 to 30 carbon atoms; R^2 is of the formula $—(CH_2)_xR^{12}$, where x is 1 to 5 and R^{12} is carboxyl, $—CONR_2^7$, or 5-tetrazolyl, where each R^7 is hydrogen or C_{1-4} alkyl, R^3 and R^4 are each hydrogen and R^5 is carboxyl, $—CONR_2^{10}$, or 5-tetrazolyl, where each R^{10} is hydrogen or C_{1-4} alkyl, and pharmaceutically acceptable salts thereof with the proviso at least one of R_{12} and R_5 is carboxyl or 5-tetrazolyl.

6. A method of treating an animal, including a human, suffering from or susceptible to an allergy disorder, which comprises administering an effective amount of a compound according to claim 1.

4,963,580

SUBSTITUTED 5-HYDROXY-2,3-DIHYDROBENZOTHIOPHENES AS INHIBITORS OF LEUKOTRIENE BIOSYNTHESIS

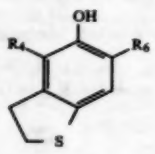
Robert A. Zambias, Springfield, and Milton L. Hammond, Somerville, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 259,372, Oct. 18, 1988, abandoned. This application Nov. 27, 1989, Ser. No. 442,497

Int. Cl.[5] A61K *31/38;* **C07D** *333/54*

U.S. Cl. 514—443 **7 Claims**

1. A compound of formula (I)



(I)

wherein: R_4 and R_6 are independently selected from:

(a) hydrogen;

(b) C_{2-6}alkenyl;

(c) C_{3-6}alkyl; and

(d) substituted C_{3-6}alkyl wherein the substitutent is phenylthio

or pharmaceutically acceptable salts thereof.

5. A pharmaceutical composition for treating leukotriene mediated diseases comprising a pharmaceutical carrier and a non-toxic effective amount of a compound, according to claim 1.

4,963,581

NAPHTHOPYRAN DERIVATIVES AND USE THEREOF

Tsuneo Kanamaru; Takenori Ishimaru, and Masayuki Murai, all of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

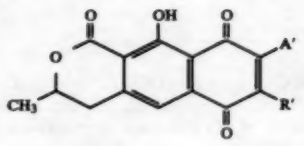
Filed Apr. 5, 1989, Ser. No. 333,248

Claims priority, application Japan, Apr. 15, 1988, 63-94170

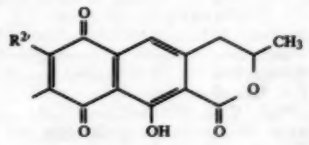
Int. Cl.[5] C07D *311/92;* **A61K** *31/365*

U.S. Cl. 514—455 **11 Claims**

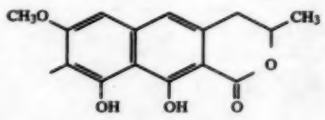
1. A compound of the formula:



wherein R' is amino which may be substituted by C_{1-3} alkyl and A' is a group of the formula



in which $R^{2'}$ is amino which may be substituted by C_{1-3} alkyl, or A' is a group of the formula



or a physiologically acceptable salt thereof.

4,963,582

MACROLIDE COMPOUNDS, THEIR PREPARATION AND THEIR USE

Kazuo Sato; Toshiaki Yanai; Takao Kinoto; Keiji Tanaka; Akira Nishida, all of Shiga; Toshimitsu Toyama, Tokyo, all of Japan; Bruno Frei, Duebendorf, and Anthony O'Sullivan, Basel, both of Switzerland, assignors to Sankyo Company Limited, Tokyo, Japan

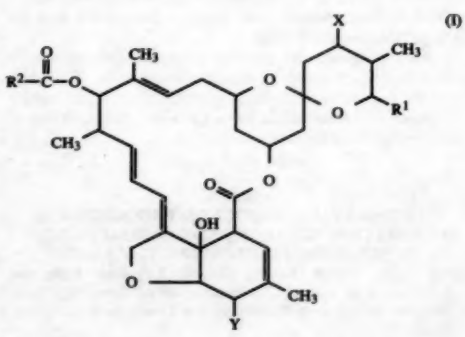
Filed Mar. 24, 1987, Ser. No. 30,217

Claims priority, application Japan, Mar. 25, 1986, 61-66315; Jun. 13, 1986, 61-137568

Int. Cl.[5] A61K *31/365;* **C07D** *493/22*

U.S. Cl. 514—450 **12 Claims**

1. Compounds having the formula



(I)

in which:

the broken line represents a carbon-carbon single or double bond between the atoms at the 22 and 23 positions;

X represents

a hydrogen atom or a hydroxyl group, or together with

the carbon atom to which it is attached represents the group C=O; provided that X represents a hydrogen atom when the broken line represents a double bond between the carbon atoms at the 22 and 23 positions;

Y represents

the group =N—OR^3,

wherein R^3 represents a hydrogen atom, an alkyl group having from 1 to 6 carbon atoms and which may optionally be substituted with at least one carboxy group, a cycloalkyl group having from 3 to 10 ring carbon atoms, or an aralkyl group having from 6 to 10 ring carbon atoms in the aryl moiety and from 1 to 6 carbon atoms in the alkyl moiety;

R^1 represents

an alkyl, alkenyl, alkynyl, alkoxyalkyl or alkylthioalkyl group, each having up to 8 carbon atoms;

a cycloalkyl-substituted alkyl group wherein the cycloalkyl moiety has from 3 to 6 ring carbon atoms and the alkyl moiety has from 1 to 5 carbon atoms:

a cycloalkyl or cycloalkenyl group having from 3 to 8 ring carbon atoms and optionally substituted with at least one substituent selected from halogen atoms and alkyl groups having from 1 to 4 carbon atoms;

a heterocyclic group having from 3 to 6 ring atoms of which at least one is an oxygen or sulfur atom and which may optionally be substituted with at least one substituent selected from halogen atoms and alkyl groups having from 1 to 4 carbon atoms;

R^2 represents

the group R^5—(O)$_n$—

wherein n=0 or 1;

R^5 represents a hydrogen atom, an alkyl group having from 1 to 22 carbon atoms, an alkenyl or alkynyl group having from 2 to 6 carbon atoms, a cycloalkyl group having from 3 to 10 carbon atoms, an aryl group having from 6 to 10 ring carbon atoms, an aralkyl group having from 6 to 10 ring carbon atoms in the aryl moiety and from 1 to 6 carbon atoms in the alkyl moiety,

wherein said alkyl group of R^5 may optionally be substituted with at least one substituent selected from:

(a) cycloalkyl groups having from 3 to 10 carbon atoms; alkoxy groups having from 1 to 6 carbon atoms; alkoxycarbonyl groups having from 2 to 7 carbon atoms; halogen atoms; aryloxy and arylthio groups having from 6 to 10 ring carbon toms, which may themselves optionally be substituted with at least one halogen atom; protected or unprotected hydroxy; carboxy; amino; monoalkylamino and dialkylamino groups having from 1 to 6 carbon atoms in the or each alkyl moiety; aliphatic acylamino groups having from 1 to 6 carbon atoms; aromatic acylamino groups; cyano; carbamoyl; monoalkylcarbamoyl and dialkylcarbamoyl groups having from 1 to 6 carbon atoms in the or each alkyl moiety; mercapto; alkylthio, alkylsulfinyl and alkylsulfonyl groups, in each case having from 1 to 6 carbon atoms; nitro;

and wherein said alkenyl and alkynyl groups of R^5 may optionally be substituted with at least one substituent selected from the group consisting of:

(b) the said substituent (a); and acyl groups having from 6 to 10 ring carbon atoms; and the said cycloalkyl, aryl, aralkyl;

and salts and esters of said compounds of formula (I).

8. A method of protecting animals or plants from damage by parasites selected from acarids, helminths and insects, which comprises applying to said animals or plants, or to said seeds of said plants or to a locus including said animals, plants or seeds, and effective amount of a compound as claimed in claim 1.

4,963,583

BETA-IONONE DERIVATIVES AS ANTIFUNGAL AGENTS

Walter Kunz, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

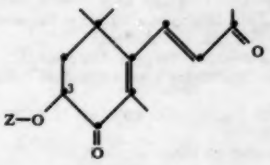
Filed Sep. 28, 1988, Ser. No. 250,201

Claims priority, application United Kingdom, Oct. 5, 1987, 87 23325; May 26, 1988, 88 12525

Int. Cl.^{5} C07C *125/065, 69/03;* **A01N** *37/02, 47/18*

U.S. Cl. 514—484 **16 Claims**

1. A 3-acyloxy-4-keto-β-ionone derivative of the formula I



(I)

wherein Z is either the radical

in which R_1 represents C_3–C_5-alkyl, C_1–C_5 alkoxy-C_1–C_5 alkyl having a maximum number of 6 carbon atoms, cyclopropyl or cyclopropyl which is substituted by methyl or by halogen or represents the radical

wherein R_2 represents C_1–C_5alkyl, C_1–C_5 alkoxy-C_1–C_5 alkyl having a maximum number of 6 carbon atoms, cyclopropyl or cyclopropyl which is substituted by methyl or by halogen and X represents either oxygen or sulphur.

4,963,584

PYRETHROIDAL COMPOSITION COMPRISING MORE THAN ONE ACTIVE INGREDIENTS

György Hidasi, Budapest; István Székely, Dunakeszi; Béla Bertók, Budapest; Sándor Zoltán, Budapest; Lajos Nagy, Szentendre; Antal Gajári, Budapest; Éva Somfai, Budapest; Ágnes Hegedüs, Budapest; László Pap, Budapest; Ruldof Soós, Budapest; Erzsébet Radványy, Budapest; Sándor Botár, Budapest, and Tamás Szabolcsi, Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

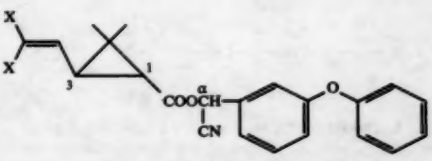
Continuation of Ser. No. 918,129, Oct. 27, 1986, abandoned. This application Jun. 19, 1989, Ser. No. 371,650

Claims priority, application Hungary, Jan. 16, 1985, 158/85; Jan. 8, 1986, 74/86

Int. Cl.^{5} A01N *37/34*

U.S. Cl. 514—521 **5 Claims**

1. An insecticidal composition, which comprises as active ingredient in an amount of 0.001–99% by weight a synthetic pyrethroid of the Formula I



(I)

wherein X stands for chlorine—namely out of the eight possible isomers at least 95% of a 3:7 to 5:5 crystalline 1Mixture of the enantiomer pairs Ia:Ib, wherein Ia is 1RcisS+1ScisR and Ib is 1RtransR+1StransR—having a reduced mammalian toxicity by comparison with the enantiomer pair Ia and reduced toxicity to bees and a useful arthropod *Aphidinus matricuriae* by comparison with the enantiomer pair Ia.

4,963,585

COMPOUND, WF11605 AND DERIVATIVE THEREOF

Masanori Okamoto; Eisaku Tsujii; Tsutomu Kaizu; Hiroshi Hatanaka; Masakuni Okuhara; Kozo Sawada, and Hirokazu Tanaka, all of Tsukuba, Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

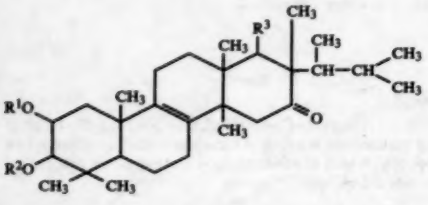
Filed Feb. 14, 1989, Ser. No. 310,323

Claims priority, application United Kingdom, Feb. 15, 1988, 8803426

Int. Cl.[5] A61K *31/19, 31/70;* **C07C** *69/74;* **C07H** *15/24*

U.S. Cl. 514—529 **5 Claims**

1. A compound of the formula:

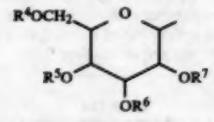


(I)

wherein

R^1 is hydrogen or lower alkanoyl,

R^2 is hydrogen or



in which

R^4, R^5, R^6 and R^7 are hydrogen or lower alkanoyl,

R^3 is carboxy or a protected carboxy,

and pharmaceutically acceptable salt thereof.

4,963,586

MICROBICIDAL/MICROBISTATIC COMPOSITION

Sakae Katayama, Osaka; Yosuke Ito, Ohtsu, and Hidenori Hirashima, Osaka, all of Japan, assignors to Katayama Chemical, Inc., Osaka, Japan

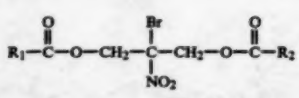
Filed Apr. 14, 1989, Ser. No. 338,609

Claims priority, application Japan, Apr. 18, 1988, 63-96523

Int. Cl.[5] A61K *37/02, 37/06*

U.S. Cl. 514—547 **11 Claims**

1. A microbicidal/microbistatic composition for industrial use comprising, as active ingredients, a nitrobromopropane derivative of the formula (I):



(I)

wherein R_1 and R_2 are the same and are a hydrogen atom or a methyl group, and 2,2-dibromo-3-nitrilopropionamide in a ratio of from 10:1 to 1:10 by weight.

4,963,587

GLYCINE DERIVATIVE AND PHARMACEUTICAL PREPARATION THEREOF

Takeo Iwakuma, Ageo; Yasuo Sekine, Kawaguchi; Yasuhiko Sasaki; Katsuo Ikezawa, both of Urawa, and Akio Odawara, Tokyo, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

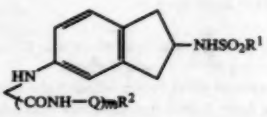
Filed Dec. 5, 1989, Ser. No. 446,106

Claims priority, application Japan, Jan. 10, 1989, 1-3548

Int. Cl.[5] A61K *31/195;* **C07C** *311/21*

U.S. Cl. 514—562 **8 Claims**

1. A glycine derivative of the formula:



(I)

wherein R^1 represents a substituted or unsubstituted phenyl group, R^2 represents a carboxyl group which may be protected, Q represents a lower alkylene group and m represents 0 or 1 or a pharmacologically acceptable salt thereof.

6. A pharmaceutical composition exhibiting platelet aggregation inhibiting activity which comprises a therapeutically effective amount of the compound in claim 1 or a pharmaceutically acceptable salt thereof in admixture with a pharmaceutically acceptable carrier or diluent.

4,963,588

USE OF UBENIMEX FOR TREATING MYELODYSPLASTIC SYNDROME

Yoshiro Uzuka, and Yoshiko Saito, both of Sendai, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 10, 1990, Ser. No. 462,822

Claims priority, application Japan, Feb. 23, 1989, 1-41630

Int. Cl.[5] A61K *31/195*

U.S. Cl. 514—563 **1 Claim**

1. A method for treating myelodysplastic syndrome (MDS) in human having MDS which comprises administering ubenimex or a pharmacologically acceptable salt thereof in an effective amount to said human for treating myelodysplastic syndrome.

4,963,589

METHODS FOR TREATING *GIARDIA LAMBLIA*

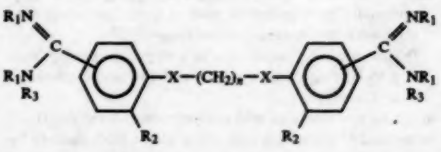
Richard R. Tidwell; Dieter J. Geratz, both of Chapel Hill, N.C., and Kwasi A. Ohemeng, Clinton, N.J., assignors to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Filed Oct. 25, 1988, Ser. No. 262,324

Int. Cl.[5] A61K *31/155, 31/415*

U.S. Cl. 514—636 **5 Claims**

1. A method for treating giardiasis comprising administering to an afflicted host patient a therapeutically effective amount for treating giardiasis of compound having the structure of formula I:



I

wherein X is O, N or S; R_1 is H; R_2 is H, NH_2, OCH_3, Cl, or NO_2; R_3 is H, CH_3 or CH_2CH_3 and n=2—6, or a pharmaceutically acceptable salt thereof.

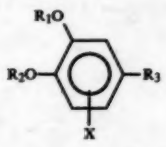
4,963,590

PHARMACOLOGICALLY ACTIVE COMPOUNDS, METHODS FOR THE PREPARATION THEREOF AND COMPOSITIONS CONTAINING THE SAME

Reijo J. Bäckström, Helsinki; Kalevi E. Heinola, Jävenpää; Erkki J. Honkanen, Vantaa; Seppo K. Kaakkola, Helsinki; Pekka J. Kairisalo, Helsinki; Inge-Britt Y. Linden, Helsinki; Pekka T. Männistö, Helsinki; Erkki A. O. Nissinen, Espoo; Pentti Pohto, Helsinki; Aino K. Pippuri, and Jarmo J. Pystynen, both of Espoo, all of Finland, assignors to Orion-yhtymä Oy, Finland

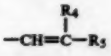
Filed Nov. 27, 1987, Ser. No. 126,911
Claims priority, application Finland, Nov. 28, 1986, 864875
Int. Cl.[5] A61K 31/12
U.S. Cl. 514—678 14 Claims

1. A pharmaceutical composition for inhibiting catechol-O-methyl-transferase, said composition comprising a catechol-O-methyl-transferase inhibiting amount of a compound having the formula I



I

wherein R_1 and R_2 independently represent hydrogen or alkylcarbonyl of 2 to 5 carbon atoms, X represents nitro or cyano and R_3 represents



wherein R_4 represents cyano or alkylcarbonyl of 2 to 5 carbon atoms and R_5 represents cyano; alkylcarbonyl of 2 to 5 carbon atoms; alkoxycarbonyl of 2 to 9 carbon atoms; or carbamoyl which is unsubstituted or substituted with alkyl of 1 to 8 carbon atoms, or hydroxyalkyl of 1 to 8 carbon atoms, and a pharmaceutically acceptable carrier.

4,963,591

COSMETIC COMPOSITIONS

Robert G. Fourman, Plainsboro; Richard P. Dixon, Aberdeen, and Hans Breuer, Bridgewater, all of N.J., assignors to Carter-Wallace Inc., New York, N.Y., a part interest

Filed Dec. 16, 1985, Ser. No. 809,102
Int. Cl.[5] A61K 7/021, 7/06, 7/13, 7/32, 7/40, 7/48
U.S. Cl. 514—944 2 Claims

1. A composition which when applied to the skin provides a fine, thin substantive film characterized by cosmetically acceptable tactile properties, strong adherence to the skin and high resistance to removal by water or abrasion consisting essentially of (a) from about 0.1% to about 10.0% by weight of a cellulosic ether having an ethoxyl content above about 47% and (b) from about 20% to about 95% by weight of a lower aliphatic alcohol organic solvent for said cellulosic ether.

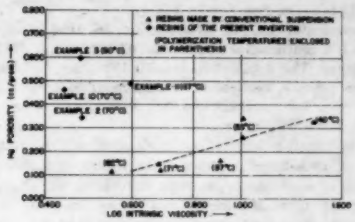
4,963,592

SUPER POROUS LOW MOLECULAR WEIGHT VINYL HALIDE RESINS

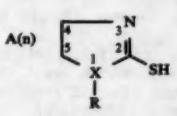
Zaev Sharaby, South Euclid, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 20, 1989, Ser. No. 440,551
Int. Cl.[5] C08V 9/20
U.S. Cl. 521—56 8 Claims

1. An aqueous suspension polymerization process for producing porous low molecular weight resin particles having an I.V. of from about 0.1 to about 1.0 and a porosity of from about 0.1 cc/g to about 1.0 cc/g as measured by mercury intrusion comprising polymerizing a vinyl halide monomer or mixtures of a vinyl halide monomer with at least one ethylenically-



unsaturated comonomer that is copolymerizable therewith in the presence of a modifier represented by the formula:



(I)

wherein X is N, S or O; R is H or lower alkyl with the proviso that when X is S or O, R is not present; and A, if present, taken together with the carbon atoms to which it is attached represents a benzene ring; and n represents 0 or 1 with the proviso that when n is 0, positions 4 and 5 of the heterocyclic ring are saturated or unsaturated.

4,963,593

FLAME RETARDANT INTERNALLY CURED POLYURETHANE FOAM HAVING IMPROVED PROPERTIES

Michael A. Ricciardi, Statesville, N.C., and Fred N. Teumac, Spartanburg, S.C., assignors to Knoll International Holdings, Inc., New York, N.Y.

Filed Jul. 7, 1988, Ser. No. 216,592
Int. Cl.[5] C08J 9/00
U.S. Cl. 521—128 31 Claims

1. A flexible polyether derived polyurethane foam forming composition comprising a polyether polyol, an organic isocyanate compound, water, and a curing agent of the formula

$$C_3N_6(R_2)_x(R_1)_{6-x}$$

wherein R_1 is hydrogen or an alkyl, alkenyl, cycloaliphatic or aryl moiety having between one and twelve carbon atoms; R_2 is an alkyl, alkenyl, cycloaliphatic or aryl moiety having between one and twelve carbon atoms and at least one hydroxyl moiety; and x is between about 0.5 and 6, which curing agent is substantially non-reactive with the foam forming components but which acts as a catalyst to the reaction of remaining isocyanate groups with moisture in the foam after formation thereof, said curing agent added in an amount effective to cause the reaction of a sufficient number of said remaining isocyanate groups with said moisture to improve the compression set properties of the resulting flexible foam but less than about 2 parts by weight based on 100 parts by weight polyol.

4,963,594

HEAT/COLOR STABILIZED POLYMERS OF VINYL CHLORIDE

Michel Gay, Lyons, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Continuation of Ser. No. 686,146, Dec. 26, 1984, abandoned, which is a continuation of Ser. No. 479,936, Mar. 29, 1983, abandoned. This application Jul. 21, 1989, Ser. No. 389,576
Claims priority, application France, Mar. 30, 1982, 82 05700
Int. Cl.[5] C08K 5/37
U.S. Cl. 524—305 **14 Claims**

1. A stabilized polymeric composition of matter, comprising a vinyl chloride based polymer, and a stabilizing amount therefor of (i) at least one organozinc derivative, (ii) at least one organic derivative of a metal from Group IIa of the Periodic Table, and (iii) at least one thiomalic acid diester.

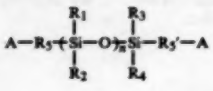
4,963,595

POLYSILOXANE-POLYLACTONE BLOCK COPOLYMERS

Robert S. Ward, Lafayette, and Judy S. Riffle, Oakland, both of Calif., assignors to Thoratec Laboratories Corporation, Berkeley, Calif.

Continuation of Ser. No. 11,542, Feb. 6, 1987, abandoned, which is a division of Ser. No. 688,788, Jan. 4, 1985, Pat. No. 4,663,413. This application Dec. 22, 1988, Ser. No. 290,822
Int. Cl.[5] C08G 63/91
U.S. Cl. 525—415 **5 Claims**

1. A method of increasing the crystallization rate of polyethylene terephthalate by blending therewith a polysiloxane/-polycaprolactone block copolymer of the formula (I):

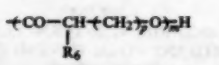


(A)

wherein

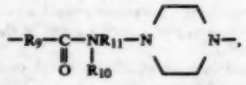
n is an integer from 1 to about 200; R_1, R_2, R_3 and R_4 are independently linear or branched alkyl, alkenyl, haloalkyl, or haloalkenyl of 1 to 6 carbon atoms; aryl of 5 to 7 carbon atoms; aralkyl of 6 to 8 carbon atoms;

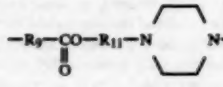
A and A' are independently



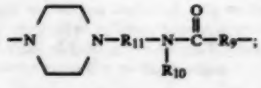
p is an integer from 0 to 6; m is an integer from 1 to about 250; R_6 is hydrogen or linear or branched alkyl of 1 to 6 carbon atoms;

R_5' is $-R_7-O-$, $-R_7-NR_8-$,





R_5 is $-O-R_7-$, $-NR_8-R_7-$;



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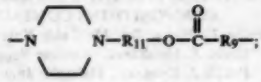
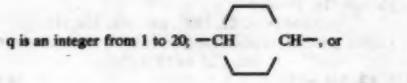
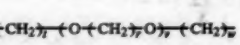


R_7, R_9 and R_{11} are independently $-(CH_2)_q-$,



q is an integer from 1 to 20, —CH CH—, or



where r, t and w are independently integers from 1 to 6 and v is an integer from 1 to about 100;

R_8 and R_{10} are independently hydrogen or alkyl of 1 to 6 carbon atoms.

4,963,596

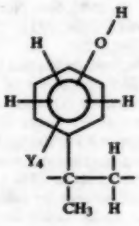
TREATMENT AND AFTER-TREATMENT OF METAL WITH CARBOHYDRATE-MODIFIED POLYPHENOL COMPOUNDS

Andreas Lindert, Troy; John R. Pierce, Huntington Woods; David R. McCormick, Madison Heights, and William D. Zimmermann, Farmington Hills, all of Mich., assignors to Henkel Corporation, Ambler, Pa.

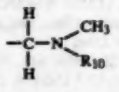
Filed Dec. 4, 1987, Ser. No. 128,673
Int. Cl.[5] C08F 12/24
U.S. Cl. 526—313 **18 Claims**

1. A polymer compound comprising:

a copolymer material wherein at least one portion of said co-polymer has the structure:



wherein y_4 is:



R_{10} is a hydroxy-alkyl substituent resulting from the reduction of an imine generated by the condensation of an amine and an aldose, ketose or mixture thereof; and at least a fraction of said portion is polymerized with acrylonitrile.

4,963,597

SELECTIVE GEL SYSTEM FOR PERMEABILITY PROFILE CONTROL

Paul Sau, West Windsor, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 292,127, Dec. 30, 1988, Pat. No. 4,903,766. This application Jan. 22, 1990, Ser. No. 468,331

Int. Cl.[5] C08L 5/00, 61/12

U.S. Cl. 523—130 18 Claims

1. A selective gel for closing pores in a more permeable zone of a formation comprising:

(a) an aqueous solution of a first composition sufficient to form ex-situ a size selective, shear thinning first gel which comprises

(i) a xanthan biopolymer, and

(ii) a transitional metal ion; and

(b) an aqueous solution of a second composition sufficient to form thermally a second in-situ gel that which comprises

(i) an aldehyde, and

(ii) a phenolic compound which solutions are combined and allowed to form a shearable, rehealable ex-situ gel which can be injected into said permeable zone where it reheals when heated by said formation and thereafter forms a solid gel substantially more resistant to formation conditions than said first gel.

4,963,598

GAMMA RADIATION RESISTANT POLYCARBONATE COMPOSITIONS

Sivaram Krishnan, Pittsburgh; Richard E. Keegan, McMurray; Neil H. Nodelman, and Charles E. Lundy, both of Pittsburgh, all of Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. /183,023, Apr. 18, 1988, abandoned. This application Jan. 18, 1989, Ser. No. 297,264

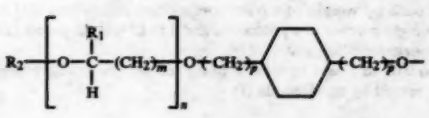
Int. Cl.[5] C08K 5/54, 5/15, 5/10, 5/06

U.S. Cl. 523—137 13 Claims

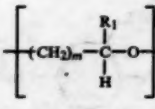
1. A polycarbonate molding composition comprising

(i) an aromatic polycarbonate resin and about 0.1 to 10.0% of

(ii) a stabilizing agent conforming to



(I)



wherein R_1 denotes a hydrogen atom or a C_1–C_4 alkyl, R_2 denotes a hydrogen atom, a C_1–C_{30} alkyl or acyl radical, silyl or pyranyl where said alkyl and acyl radicals are either branched or linear, n is an integer of from 1 to 70, p is 0 or 1 and m is 1 to 4.

4,963,599

PREPARATION OF WOODWORKING MATERIALS

Christof Schmidt-Hellerau, Ludwigshafen, and Johann Mayer, Freinsheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 251,390

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1987, 3733630

Int. Cl.[5] C08K 9/04, 9/12; C08J 3/18, 5/06

U.S. Cl. 523—211 10 Claims

1. A process for the preparation of woodworking materials having a lower subsequent formaldehyde emission, by mixing lignocellulose-containing particles with a curable binder based on curable aminoplast condensates and then pressing the mixture under the action of heat, a mixture A containing a water-compatible agent for binding formaldehyde being applied to or mixed with the particles before the latter are mixed with the curable binder, wherein the mixture A is an aqueous solution which has a pH of from 3.0 to 6.5 and contains

(a) organic C_1–C_{10} carboxylic acids which attack wood only insignificantly or not at all, in an amount of more than 15% by weight, based on the solids content of the solution, and

(b) a formaldehyde-binding, nitrogen-containing compound, selected from the group consisting of ureas, amides, amine salts, urethanes, melamine, polyacrylamides and mixtures thereof.

4,963,600

CHROMA NEUTRALIZATION OF CLEAR COATS BY ADDING PIGMENT DISPERSIONS

Joseph F. Coughlin, Moberly, Mo., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 19, 1988, Ser. No. 287,855

Int. Cl.[5] C08J 3/20

U.S. Cl. 523—333 3 Claims

1. A method for minimizing inherent yellowness in any clear film composition having a binder and a solvent or dispersion medium comprising adding a blue pigment dispersion to the clear film composition in amounts so that the quality of the pigment in the clear film composition ranges from about 0.0001 to 0.01 parts of the pigment to 100.0 parts of the binder, such that the blue pigment results in a chroma neutralization of the inherent yellowness.

3. A method for minimizing inherent yellowness in any clear automotive finish composition comprising adding a blue dye solution to the clear film composition in amounts so that a very small quantity of blue dye is present in said clear film composition in sufficient quantity that the blue dye results in a chroma neutralization of the inherent yellowness.

4,963,601

POLYMER NON-AQUEOUS DISPERSION, PROCESS FOR PREPARING THE SAME AND COATING COMPOSITION FORMULATED THEREWITH

Kishio Shibato, Kamakura; Fumio Sakurai, Chigasaki; Atsuhiro Sakai, Yokohama; Toru Imai, Yokohama, and Osamu Obe, Tokyo, all of Japan, assignors to Nippon Oil and Fats Company, Limited, Tokyo, Japan

Continuation of Ser. No. 225,378, Jul. 28, 1988, abandoned. This application Jul. 24, 1989, Ser. No. 384,098

Claims priority, application Japan, Aug. 12, 1987, 62-200061; Nov. 13, 1987, 62-285607; Dec. 3, 1987, 62-304543; May 2, 1988, 63-109580

Int. Cl.[5] C08K 3/00, 33/00

U.S. Cl. 523—339 15 Claims

1. A process for preparing polymer non-aqueous dispersions, which comprises the steps of:

emulsion polymerizing the following components:

(a) an α,β-ethylenically unsaturated monomer containing a hydroxyl group

(b) a polyfunctional α,β-ethylenically unsaturated monomer, and

(c) an α,β-ethylenically unsaturated monomer other than the above (a) and (b),

by using a water soluble polymerization initiator in a soap-free system or in the presence of a surface active agent containing an ester group; adding an organic solvent to a resultant polymer aqueous dispersion; and then adding a basic compound catalyst or an acidic compound catalyst thereto to hydrolyze completely said surface active agent and water-soluble polymerization initiator at a temperature not exceeding 95° C. as in the condition of suspension;

adding an acidic compound or basic compound to said suspension to neutralize said basic compound catalyst or acidic compound catalyst; then after adding a dispersion stabilizing resin, further adding an amine salt of organic acid, followed by leaving a system of said suspension to stand to separate into two layers, an organic layer and a water layer; after removing the water layer, washing the organic layer by adding water; adding an amine salt of an organic acid, followed by standing to separate: and removing the water layer; and

removing residual water in the organic layer.

4,963,602

AQUEOUS EPOXY RESIN-ACRYLIC RESIN COATING COMPOSITIONS CONTAINING ALSO PHENOXY, NOVOLAC AND RESOLE RESIN COMBINATION

Hiresdra K. Patel, Louisville, Ky., assignor to Hi-Tek Polymers, Inc., Jeffersontown, Ky.

Filed Nov. 13, 1989, Ser. No. 435,587

Int. Cl.[5] C08F 8/00; C08L 61/04, 63/00

U.S. Cl. 523—403 **12 Claims**

1. A heat curable aqueous coating composition comprising an aqueous dispersion of an ammonia or amine salted resinous composition comprised of:

(a) about 35 to about 55 weight percent epoxy resin;

(b) about 7 to about 30 weight percent acrylic resin;

(c) about 10 to about 30 weight percent phenoxy resin;

(d) about 5 to about 15 weight percent alkylated phenol novolac resin; and

(e) 3 to about 10 weight percent resol resin,

said weight percent being based on the total weight of (a), (b), (c), (d) and (e),

wherein the epoxy resin is a glycidyl polyether of a dihydric phenol having an epoxide equivalent weight of about 1200 to about 6000;

wherein the acrylic resin is a copolymer of a polymerizable ethylenically unsaturated carboxylic acid monomer and a monomer copolymerizable therewith, said comonomer being free of acid groups, wherein the polymerizable acid is present in the acrylic resin in the amount of about 5 to about 45 weight percent based on the total weight of the acrylic resin, wherein the phenoxy resin is the reaction product of epichlorohydrin and Bisphenol A having a molecular weight of about 6,000 to about 85,000

wherein the alkyl substituent in the alkylated phenol novolac resin contains about 8 to about 12 carbon atoms, and wherein the resol resin has a softening print of about 55 to about 85° C. and a cure time on a hot plate at 185° C. of about 60–130 seconds.

4,963,603

COMPOSITE FIBERBOARD AND PROCESS OF MANUFACTURE

John Felegi, Jr., and Kenneth P. Kehrer, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 356,217, May 24, 1989, abandoned, which is a continuation-in-part of Ser. No. 275,914, Nov. 25, 1988. This application Nov. 15, 1989, Ser. No. 434,041

Int. Cl.[5] C08L 89/00; C08K 3/34, 3/40; D21F 11/00

U.S. Cl. 524—13 **14 Claims**

1. A composite board which comprises up to 87% by weight mineral wool, 5–65% by weight perlite, up to 25% by weight clay, 4–35% by weight cellulosic newsprint composed primarily of cellulosic fibers, and 2–15% by weight of a thermoplastic polymeric binder having a glass transition temperature of from 80° C. to 115° C., the ratio of said binder to said cellulosic newsprint being no greater than about 1.25 when said cellulosic newsprint content is less than 6% by weight and said ratio being no greater than 0.7 when said cellulosic newsprint content is at least 6% by weight, wherein the cellulose fibers in said board are substantially completely coated with said thermoplastic binder, said board displaying a sag of less than 200 mils when a 0.6 inch thick sample, 9 inches wide and 24 inches long is supported at both ends and exposed to a temperature of 85° F. and a relative humidity of 95% for 24 hours.

4,963,604

POLYMERIC PIGMENTS USED IN PAPER COATING COMPOSITIONS AND A PROCESS FOR THEIR PREPARATION

Charles E. Coco, and Lawrence M. Scacciaferro, both of St. louis, Mo., assignors to Protein Technologies International, Inc., St. Louis, Mo.

Continuation of Ser. No. 60,694, Jun. 11, 1987, abandoned. This application Feb. 24, 1989, Ser. No. 315,216

Int. Cl.[5] C08L 89/00; C08J 3/00; C08H 1/00

U.S. Cl. 524—17 **41 Claims**

1. A paper coating composition comprising an aqueous dispersion of isolated soy protein in an amount effective to bind said composition to a paper substrate, and an aqueous dispersion of a pigment in an amount effective to opacify said composition when applied to a paper substrate, wherein said pigment dispersion comprises a mixture of an inorganic pigment and a polymeric pigment wherein the polymeric pigment comprises a copolymer consisting essentially of protein and a monomer having a glass transition temperature greater than about 70° C.

4,963,605

STABILIZED POLYOLEFIN COMPOSITION

Yoshiharu Fukui; Kazuhisa Kuroda, both of Ichihara; Tamaki Ishii, Suita, and Manji Sasaki, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 233,891, Aug. 15, 1988, Pat. No. 4,839,408, which is a continuation of Ser. No. 927,712, Nov. 7, 1986, abandoned. This application Mar. 16, 1989, Ser. No. 324,538

Claims priority, application Japan, Nov. 8, 1985, 60-251726; Nov. 8, 1985, 60-251725

The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.

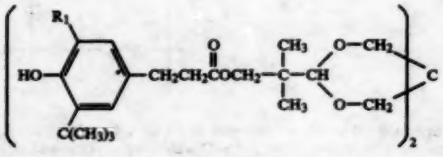
Int. Cl.[5] C08K 5/15, 5/34

U.S. Cl. 524—108 **7 Claims**

1. A polyolefin composition which is comprised of a blend of 100 parts by weight of a resin composition comprising 100 to 35 weight percent of a polyolefin and 0 to 65 weight percent of an inorganic filler, and

(a) 0.01 to 1 part by weight of a phenolic compound represented by the formula (I):

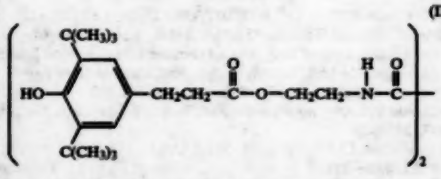
(I)



wherein R_1 represents a C_1–C_3 alkyl group,

(b) 0.01 to 10 parts by weight of metal deactivator represented by the formula (III-5);

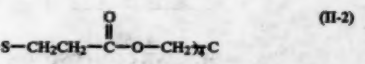
(III-5)



(c) 0.01 to 1 part by weight of a sulfur-containing compound represented by the formula (II-1) or (II-2):

(II-1)

wherein R_2 represents a C_4–C_{20} alkyl group,



(II-2)

wherein R_3 represents a C_4–C_{20} alkyl group.

4,963,606

THERMALLY STABILIZED STYRENIC POLYMER-BASED THERMOPLASTIC FORMULATIONS

Robert A. Schleifstein, Edison, N.J., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 6, 1989, Ser. No. 403,405
Int. Cl.[5] C08K 5/58
U.S. Cl. 524—180 **11 Claims**

1. A styrenic polymer-based thermoplastic formulation which comprises:

(a) general-purpose polystyrene or impact-modified polystyrene;

(b) a flame retardant amount of a brominated cycloaliphatic compound; and

(c) a thermal stabilizer system comprised of,

(i) from about 2 to about 10 weight percent of a dibutyltin mercaptide stabilizer,

(ii) from about 1 to about 3 weight percent of a hindered phenolic antioxidant, and

(iii) from about 1.5 to about 6 weight percent of a polyhydroxy aliphatic compound which is capable of chelating metals which may be present in said thermoplastic formulation,

said weight percentages being based on the weight of said brominated cycloaliphatic compound in the thermoplastic formulation.

4,963,607

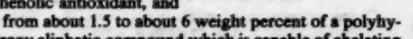
COMPOSITIONS AND METHODS USING ORGANOSULFIDES FOR STABILIZATION OF POLYOLEFINS AGAINST PHOTODEGRADATION

James L. Reilly, Towamencin, and Joseph M. Bohen, King of Prussia, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 220,875, Jul. 15, 1988, abandoned, which is a continuation of Ser. No. 924,104, Oct. 31, 1986, abandoned, which is a continuation of Ser. No. 639,486, Oct. 10, 1984, abandoned. This application Jun. 13, 1989, Ser. No. 366,311
Int. Cl.[5] C08K 5/36
U.S. Cl. 524—291 **32 Claims**

1. A method for stabilizing polyolefin resin against degradation by UV-light which comprises incorporating in said polyolefin resin a UV-light stabilizing composition comprising:

(I) a synergizing effective amount of an organosulfide for UV-light stabilization, said organosulfide having the general formula:



wherein R_1 and R_3 may be the same or different and are independently selected from the group of hydrogen, alkyl having 1 to 30 carbon atoms, cycloalkyl having 3 to 20 carbon atoms, cycloalkylalkyl having 4 to 20 carbon atoms, and aryl having 6 to 20 carbon atoms, which radicals may optionally be substituted with substituents from the group of halogen or —YR, wherein Y is either oxygen or sulfur and R is a hydrocarbon radical from the group of alkyl having 1 to 20 carbon atoms, alkenyl having 2 to 20 carbon atoms, cycloalkyl having 3 to 20 carbon atoms, aryl having 6 to 20 carbon atoms, or alkaryl having 7 to 20 carbon atoms;

m represents a number from 1 to 10;

R_2 represents a linking group selected from the group of straight or branched, saturated or unsaturated, aliphatic having 2 to 20 carbon atoms, an alicyclic having 3 to 20 carbon atoms, alicyclicalkyl having 4 to 20 carbon atoms, or aromatic having 6 to 20 carbon atoms or a plurality of said linking groups, which may be the same or different, and which are joined by oxygen or sulfur, provided that when R_2 is aliphatic no two sulfur atoms are attached to the same R_2 carbon atom;

X_1 and X_2 represent oxygen or sulfur, at least one of said X_1 and X_2 being sulfur; and

n is a number from 1 to 1,000, provided that when R_2 is aliphatic having 5 or less carbon atoms n must equal 1; and

(2) a benzophenone having UV-light stabilizing activity or an aromatic acid ester having UV-light stabilizing activity, or mixtures thereof.

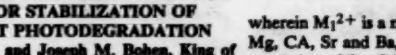
4,963,608

HALOGEN-CONTAINING THERMOPLASTIC RESIN COMPOSITION

Makoto Kunieda, Hirakata, and Hiroshi Takida, Takatsuki, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki, Osaka and Kyowa Kagaku Kogyo Kabushiki Kaisha, Takamatsu, both of, Japan

Filed Dec. 23, 1988, Ser. No. 288,905
Claims priority, application Japan, Dec. 29, 1987, 62-336191
Int. Cl.[5] C08K 5/04, 3/18; C08L 27/00
U.S. Cl. 524—394 **8 Claims**

1. A halogen-containing thermoplastic resin composition comprising a halogen-comprising thermoplastic resin (A); a metal soad (B) selected from Group II metal salts of higher fatty acids, resin acid and naphthenic acid; an ethylenevinyl acetate copolymer hydrolysate (C) having an ethylene content in the range of 20 to 75 mole percent, a degree of saponification not less than 50 mole percent, an ash content not exceeding 300 ppm and an alkali metal content not exceeding 200 ppm; and a hydrotalcite type solid solution (D) of the general formula



wherein M_1^{2+} is a metal selected from the group consisting of Mg, CA, Sr and Ba, M_2^{2+} is a metal selected from the group consisting of Zn, Cd, Pb and Sn, M^{3+} is a trivalent metal, A^{a-} is an anion having a valence of n and x, y1, y2 and m are positive numbers in the ranges of $0<x\leq 0.5$, $0.5<y1<1$, $0.5<y2<1$ and $0\leq m<2$, respectively, the proportions of (B), (C) and (D) based on 100 parts of weight of (A) being 0.1 to 5 parts by weight, 0.1 to 5 parts by weight and 0.01 to 5 parts by weight, respectively.

4,963,609

LOW SMOKE AND FLAME-RESISTANT COMPOSITION

Jerrel C. Anderson, Vienna, W. Va.; Subhash V. Gangal, Hockessin, Del.; Dewey L. Kerbow, Vienna, W. Va., and Charles W. Stewart, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 1, 1989, Ser. No. 430,138
Int. Cl.[5] C08K 3/22
U.S. Cl. 524—413 **13 Claims**

1. Melt-processible fluoropolymer composition comprising:

(a) an ethylene copolymer consisting of 25–43 mole % ethylene monomer units, 0.2 to 2.0 mole % monomer units of a fluorine-containing, copolymerizable, non-telogenic termonomer of the formula selected from $RCF{=}CF_2$, $R'CH{=}CH_2$, and $ZOCF{=}CF_2$, in which R is a normal perfluoroalkyl group of 1–5 carbon atoms, R' is a normal perfluoroalkyl group of 3–5 carbon atoms, and Z is a normal perfluoroalkyl group of 1–4 carbon atoms, and the

balance, to 100%, of monomer units selected from the class consisting of tetrafluoroethylene and chlorotrifluoroethylene monomer units, and mixtures thereof;

(b) an effective smoke suppressant and flame retardant amount, at least 0.5 weight %, of a metal oxide selected from the class consisting of TiO_2, ZnO, and mixtures thereof; and

(c) an effective drip suppressant amount of a non-melt-processible, dispersion-polymerized, fine powder polytetrafluoroethylene.

4,963,610

FLAME-RESISTANT POLYAMIDE MOLDING COMPOSITION AND METHOD OF MANUFACTURE THEREOF

Eduard Schmid, Bonaduz, and Doris Luedi, Chur, both of Switzerland, assignors to EMS-Inventa AG, Switzerland

Filed Mar. 21, 1989, Ser. No. 326,897

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1988, 3810519

Int. Cl.[5] C08K 3/22

U.S. Cl. 524—436 56 Claims

1. A flame-resistant polyamide molding composition comprising

(a) 25% to 40% by weight of a thermoplastic polyamide,

(b) 40% to 70% by weight of magnesium hydroxide particles in platelet form having a specific surface area of less than 18 m^2/g,

(c) 0.1% to 20% by weight of an olefin homo- or copolymer having one or more functional groups, selected from the group consisting of carboxyl acid, carboxyl anhydride and their corresponding esters and

(d) 3% to 30% by weight of reinforcing fibers which are inert to said composition.

4,963,611

VINYL ACETATE RESIN EMULSION COMPOSITION

Shigeru Nagasawa, Hasuda; Hisao Noziri, Oomiya; Yoshizumi Nakai, Iwatsuki; Yasuaki Araki, Oomiya; Eizo Sakamoto, Urawa; Masao Yagasaki, Saitama, and Mutsumi Kozima, Sakai, all of Japan, assignors to Konishi Co., Ltd., Osaka, Japan

Continuation of Ser. No. 105,059, Oct. 6, 1987, abandoned. This application Jan. 9, 1990, Ser. No. 463,007

Claims priority, application Japan, Sep. 1, 1987, 62-218365

Int. Cl.[5] C08F 2/16

U.S. Cl. 524—459 6 Claims

1. Vinyl acetate resin emulsion composition comprising vinyl acetate resin emulsion, produced by emulsion-polymerizing vinyl acetate in the presence of polyvinyl alcohol, to which glycol ether is added during emulsion-polymerization reaction, said composition having excellent properties of low viscosity, which has a small temperature-dependency, and good water resistance.

4,963,612

PLASTOELASTOMERIC POLYOLEFINIC COMPOSITIONS AND PROCESS FOR PREPARING THEM ACCORDING TO DYNAMIC VULCANIZABLE METHODS

Vittorio Bragg; Michele Manica, both of Ferrara; Emilio Martini, Bologna, and Federico Milani, Rovigo, all of Italy, assignors to Ausimont S.r.l., Milan, Italy

Filed Sep. 13, 1989, Ser. No. 406,971

Claims priority, application Italy, Sep. 13, 1988, 21906 A/88

Int. Cl.[5] C08K 5/01; C08L 23/00

U.S. Cl. 524—477 6 Claims

1. Plastoelastomeric polyolefinic compositions, comprising an intimate mixture of the following components, in the indicated percentage by weight referred to the whole mixture:

(A) 10–50% of non cross-linked polypropylene,

(B) 2–10% of an ethylene/propylene elastomeric non cross-linked copolymer, or of an ethylene/propylene/diene elastomeric non cross-linked terpolymer,

(C) 30–45% of a polymeric product insoluble in xylene at 135° C., comprising from 5 to 20% by weight polypropylene and ethylene/propylene copolymer or ethylene/-propylene/diene terpolymer, and

(D) 5–58% of an extender oil.

4,963,613

ADHESIVE COMPOSITION

Yasushi Toyoda, and Saburo Mishiba, both of Niihama, Japan, assignors to Sumitomo Naugatuck Co., Ltd., Osaka, Japan

Filed Jul. 7, 1989, Ser. No. 376,548

Claims priority, application Japan, Jul. 7, 1988, 63-169288; Oct. 13, 1988, 63-258069; Mar. 20, 1989, 1-68269

Int. Cl.[5] C08K 61/10

U.S. Cl. 524—594 8 Claims

1. An adhesive composition comprising:

a polymer latex containing a copolymer which comprises

(a) 40 to 80% by weight of a conjugated diene monomer and

(b) 0.5 to 30% by weight of a cyanated vinyl monomer,

(c) 5 to 35% by weight of vinylpyridine and

(d) not more than 53% by weight of an aromatic vinyl monomer; and

a resorcin-formalin resin.

4,963,614

PRIMER COMPOSITION FOR GLASS

Masahiro Ito, Mishima, and Shingo Tsuno, Sakai, both of Japan, assignors to Sunstar Giken Kabushiki Kaisha, Osaka, Japan

Filed Nov. 27, 1989, Ser. No. 441,643

Claims priority, application Japan, Nov. 28, 1988, 63-302017

Int. Cl.[5] C08K 3/04

U.S. Cl. 524—495 4 Claims

1. A primer composition for glass which comprises a silane coupling agent selected from the group consisting of epoxysilanes and silane compounds having a functional group active to an epoxy group, a reaction product of a polyisocyanate and a silane compound having a functional group active to an isocyanate group, a film-forming agent, and 2% to 10% by weight, based on the total weight of the composition, of an acidic carbon black having pH 2.5 to 4 in admixture with a conventional organic solvent.

4,963,615

PNEUMATIC TIRES

Kazuaki Yuto, Higashimurayama, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 364,040

Claims priority, application Japan, Jun. 10, 1988, 63-141841

Int. Cl.[5] C08K 3/04; C08L 9/06

U.S. Cl. 524—496 4 Claims

1. A pneumatic tire comprising a tread portion, a sidewall portion and a bead portion, characterized in that said tread portion is prepared from a rubber composition obtained by compounding:

(A) 40–80 parts by weight of carbon black having a specific surface area of nitrogen adsorption (N_2SA) of 146–159 m^2/g and satisfying the following relation:

$$S \leq 0.375\ Dn + 0.69 \quad (I)$$

wherein S is a distribution width of particle size as a unit of mμ and Dn is an arithmetic mean particle size as a unit of mμ measured by means of an electron microscope, with

(B) 100 parts by weight of a rubber blend consisting of:

(i) 15–50 parts by weight of a high styrene content rubber ingredient comprising an emulsion-polymerized styrene-butadiene copolymer having a bound styrene content of 30–50% by weight, and the balance of said rubber blend comprising:

(ii) a low styrene content rubber ingredient comprising at least one conjugated diene polymer other than the above emulsion-polymerized styrene-butadiene copolymer of said high styrene content rubber ingredient, at least one of the polymers in the low styrene content rubber ingredient being a styrene-butadiene copolymer having an average bound styrene content of not less than 15% by weight but less than 30% by weight in a total of said polymers constituting the low styrene content rubber ingredient,

and said rubber composition has a modulus at −20° C. and 100% elongation of not more than 40 kg/cm^2 and a loss factor (tan δ) of 30° C. of not less than 0.3 as a vulcanizate.

4,963,616

COMPLEXATION-MEDIATED SOLUBILIZATION OF POLYMERS

Samson A. Jenekhe, Rochester, N.Y., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 29, 1988, Ser. No. 291,924

Int. Cl.^{5} C08L *18/71*

U.S. Cl. 524—600 **27 Claims**

1. A method of enabling solubilization in aprotic organic solvents of organic macromolecular compounds of interest from a class of oligomer and polymer compounds consisting of those characterized by the inability to dissolve in aprotic organic solvents in the pristine state, but the ability to form soluble complexes with electron acceptor mediating species comprising the step of:

Complexing an amount of the compound of interest with an amount of at least one of said mediating species to enable solubilization in the complexed form.

4,963,617

LOW TEMPERATURE SELF-CROSSLINKABLE POLYMER COMPOSITIONS AND PROCESSES

Dominique Fourquier, La Croix St. Oven, and Jean Perronin, Senlis, both of France, assignors to Societe Chimique des Charbonnages S.A., Paris, France

Filed Nov. 16, 1987, Ser. No. 122,802

Claims priority, application France, Nov. 14, 1986, 86/15842

Int. Cl.^{5} C08L *27/12*

U.S. Cl. 524—805 **9 Claims**

1. A process for self-crosslinking (meth)acrylic copolymers soluble in organic solvents, said process comprising:

providing a dispersion or solution having a solids content of between 30 and 80% by weight and a viscosity of between 5 and 5000 poises and composed of one or more organic solvents and one or more (meth) acrylic copolymers, said copolymers having been obtained by copolymerization, in an organic solvent medium, of

(a) 10 to 40% by weight of glycidyl (meth)acrylate

(b) 4 to 20% by weight of at least one monoethylenic monomer X having one or more carboxyl functional groups, and

(c) 40 to 86% by weight of at least one ethylenic comonomer Y with the proviso that monomer X and comonomer Y are different,

wherein

the sum of the epoxy functional groups and carboxyl functional groups of the monomers is about 25 mol %, relative to the total number of moles of monomers, or lower;

the ratio of the number of epoxy functional groups in the monomers to the number of carboxyl functional groups in the monomers being between 2 and 3; the weight average molecular mass of said copolymers is between 1000 and 80,000; and said dispersion contains at least one cross-linking catalyst;

the dispersion or solution is then applied and dried; and subjected to a heat treatment between 30° and 90° C.

4,963,618

POLYCARBONATE RESIN COMPOSITION WITH DIENIC IMPACT MODIFIERS

Ichiro Sasaki, Suita; Junji Oshima, Toyonaka, and Minoru Yamada, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 13, 1988, Ser. No. 218,297

Claims priority, application Japan, Jul. 16, 1987, 62-177968

Int. Cl.^{5} C08L *69/00*

U.S. Cl. 525—67 **5 Claims**

1. A polycarbonate resin composition which comprises:

50–80% by weight of a polycarbonate resin,

20–45% by weight of a poly(1,4-butylene terephthalate) resin and

5–30% by weight of an impact modifier, based on the resin composition, respectively,

the impact modifier being a core-shell polymer comprising a core consisting essentially of a polycarbonate in amounts of 40–80% by weight and a shell of a homopolymer of a copolymer of methyl methacrylate which has a glass transition temperature of not less than 60° C. in amounts of 60–20% by weight, based on the core-shell polymer, respectively.

4,963,619

MIXTURES OF POLYCARBONATES WITH SILOXANE-CONTAINING GRAFT POLYMERS

Dieter Wittmann, Bayer Aktiengesellschaft, P.O. Box 100140, D4047 Dormagen; Christian Lindner; Volker Damrath, both of Bayer Aktiengesellschaft, D 5090 Leverkusen, Bayerwerk all of Fed. Rep. of Germany; Hans-Jürgen Kress, Mobay Corporation, Plastic and Rubber Division, Bldg. 8, Mobay Rd., Pittsburgh, Pa. 15205; Horst Peters, Bayer Aktiengesellschaft, D 5090 Leverkusen, Bayerwerk, and Jochen Schoeps, Bayer Aktiengesellschaft, P.O. Box 166, D 4150 Krefeld, both of Fed. Rep. of Germany

Filed Nov. 3, 1988, Ser. No. 266,802

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737637

Int. Cl.^{5} C08G *63/48*

U.S. Cl. 525—67 **11 Claims**

1. Thermoplastic polycarbonate molding compositions containing:

A: 52 to 94% by weight of a component consisting of 50–100% by weight of one or more polycarbonates, and 0–50% by weight of a thermoplastic polymer prepared from

C.1 50 to 95 parts by weight of styrene, α-methyl styrene, nucleus-substituted styrene, methyl methacrylate or mixtures thereof and

C.2 50 to 5 parts by weight (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleic imide of mixtures thereof, the sum of the parts by weight of C.1 and C.2 amounting in each case to 100;

B. 6 to 48% by weight of one of more particulate graft polymers, characterized in the graft polymers are prepared from

B.1 20 to 90 parts by weight of a polymer graft overlay of at least one α-β-unsaturated olefinic monomer on

B.2 80 to 10 parts by weight of a graft base having a core/-shell structure consisting of a core (a) of a rubber polymer of olefinically unsaturated monomers having a glass temperature (Tg) of <0° C. and a polymer (b) of organopolysiloxane, the ratio by weight of the core (a) to the shell (b) being from 0.1:99.9 to 90:10 and the graft polymers (B) having an average particle diameter (d_{50}) of 0.05 to 10 μm and the sum of the parts by weight of B.1 and B.2 always amounting to 100 parts by weight.

4,963,620

POLYPHENYLENE ETHER-POLYAMIDE BLENDS

Thomas S. Grant, Vienna, and Ronald L. Jalbert, Parkersburg, both of W. Va., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Division of Ser. No. 89,333, Aug. 25, 1987, Pat. No. 4,826,933. This application Feb. 9, 1989, Ser. No. 308,090

Int. Cl.[5] C08L 71/12

U.S. Cl. 525—68 4 Claims

1. A thermoplastic blend composition, comprising:

(a) a polyphenylene ether resin;

(b) a polyamide resin;

(c) a compatibilizing agent present in an amount sufficient to effect compatibilization of the polyphenylene ether resin and the polyamide resin, said compatibilizing agent comprising a compound selected from the group consisting of tetracarboxylic acids of aromatic compounds, tetracarboxylic acids of alicyclic compounds, dianhydride derivatives of tetracarboxylic acids of aromatic compounds, dianhydride derivatives of tetracarboxylic acids of alicyclic compounds, and halogen substituted phthalic anhydrides; and

(d) an impact modifier comprising a rubbery polymer.

4,963,621

CROSS-LINKABLE MIXTURES BASED ON HYDROGENATED NITRILE RUBBER AND ETHYLENE/ACRYLONITRILE COPOLYMERS

Zsolt Szentivanyi, Tokyo, Japan; Werner Obrecht, Moers, and Jürgen Wassen, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 5, 1990, Ser. No. 475,248

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1989, 3904715

Int. Cl.[5] C08L 23/08, 9/03, 35/04

U.S. Cl. 525—207 6 Claims

1. Mixtures of:

(1) 20 to 98 wt. %, based on the sum of components (1)+(2), of hydrogenated nitrile rubber, and

(2) 80 to 2 wt. %, based on the sum of components (1)+(2), of ethylene/acrylonitrile copolymer, where the copolymer (2) contains 50 ppm to 2 wt. % of copolymerized (meth-)acryloyl compound selected from the group consisting of acrylic anhydrides, methacrylic anhydrides, and acrylates or methacrylates of polyvalent alcohols or polyether alcohols with at least 2 acryloly- or methacryloyl groups per molecule of this (meth-)acryloyl compound.

4,963,622

PARALOID EXTRUSION AIDS FOR HIGH MOLECULAR WEIGHT HDPE FILM RESINS

William D. Heitz, Flagtown, N.J., assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Jun. 28, 1989, Ser. No. 372,466

Int. Cl.[5] C08L 23/20, 23/10, 23/04, 33/12

U.S. Cl. 525—227 7 Claims

1. A process for improving bubble stability, reducing film gauge variation and reducing melt fracture during extrusion and formation of film from a high density polyolefin of molecular weight above 225, 000 to about 450,000 which comprises blending with said polyolefin about 0.1 to about 0.8% of an acrylic polymer polymerized from a monomer system comprising at least 50% by weight of methyl methacrylate.

4,963,623

NATURAL RUBBER LATEX FILM PRODUCTS WITH IMPROVED TEAR RESISTANCE

Robert G. Miller, North York; Duncan A. MacKillop, and Oskar T. Tankovitz, both of York, all of Canada, assignors to Ortho Pharmaceutical (Canada) Ltd., Canada

Filed Jan. 11, 1989, Ser. No. 295,679

Int. Cl.[5] A61F 6/04; C08L 7/00, 25/10

U.S. Cl. 525—237 4 Claims

1. A prophylactic condom comprising a natural rubber film comprising cured natural rubber and a styrene-butadiene copolymer, wherein said copolymer contains greater than 50 weight percent polymerized styrene, the remainder being polymerized butadiene, and wherein said copolymer is present in an amount within the range of from about 1 to 25 parts, by weight, per 100 parts by weight of natural rubber.

4,963,624

PROCESS FOR PRODUCING LIGHT-DIFFUSING METHACRYLIC RESIN ARTICLE

Kozo Ida, Tokyo, and Tetsuya Horiuchi, Otake, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Feb. 7, 1989, Ser. No. 307,629

Claims priority, application Japan, Feb. 17, 1988, 63-34862

Int. Cl.[5] C08F 265/04

U.S. Cl. 525—309 20 Claims

1. A process for producing a light diffusing methacrylic resin article consisting essentially of a substrate polymer and crosslinked polymer beads having an average particle size of 1–16 μm dispersed therein, the difference between the refractive indexes of the crosslinked polymer beads and the substrate polymer being 0.02–0.15, which comprises compounding the crosslinked polymer beads with:

(A) methyl methacrylate or a mixture of a major amount thereof with a minor amount of at least one comonomer;

(B) at least one monomer which can form a polymer compatible with the polymer obtained from (A); or

(C) a polymer-in-monomer solution obtained by partially polymerizing either the (A) monomer or the (B) monomer,

to swell the beads until a degree of swelling of from 120% to 1,500% is reached, and subjecting the resulting mixture to polymerization to obtain a light diffusing polymer and molding the polymer alone or in combination with a methacrylic resin, the main monomer unit of which is methyl methacrylate to a desired shape.

4,963,625

POLYACRYLAMIDE WHITENER OF HIGH BRIGHTNESS AND RETENTION CHARACTERISTICS AND LOW TOXICITY AND METHOD OF INCREASING PAPER WHITENESS

John W. Gowan, Jr., Washington, D.C., assignor to Westvaco Corporation, New York, N.Y.

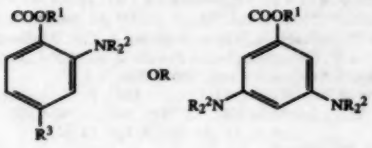
Filed Aug. 31, 1989, Ser. No. 401,624

Int. Cl.[5] C08F 8/32

U.S. Cl. 525—329.9 10 Claims

1. A polyacrylic acid amide of high brightness and retention characteristics and low biological toxicity, comprising

a polyacrylic acid having covalently bound thereto through an amide bond at least one residue and up to the total number of binding groups present in the polymer of a compound of the formula



wherein

R^1 is H, $(C_1–C_6)$alkyl, $(C_2–C_6)$alkenyl, $(C_2–C_6)$alkynyl or $(C_1–C_6)$alkoxyl;

R^2 is H, $(C_1–C_6)$alkyl, $(C_2–C_6)$alkenyl, $(C_2–C_6)$alkynyl or $(C_1–C_6)$alkoxyl; and

R^3 is H or NR_n, wherein n is 2 or 3; wherein if n=3 the compound further comprises X^-, wherein X^- is an anion.

4,963,626

CURABLE POLYMER COMPOSITION

Toshifumi Hirose, and Katsuhiko Isayama, both of Kobe, Japan, assignors to Kanegafuchi Chemical Industry Co. Ltd., Osaka, Japan

Filed Jan. 19, 1989, Ser. No. 298,968

Claims priority, application Japan, Jan. 21, 1988, 63-11789; Jan. 21, 1988, 63-11790

Int. Cl.[5] C08G 65/32

U.S. Cl. 525—403 **8 Claims**

1. (Amended) A curable polymer composition which comprises

(A) an oxyalkylene base polymer having at least one silicon-containing group to the silicon atom of which a hydroxyl group or a hydrolyzable group is bonded and which is cross linkable through formation of a siloxane bond and

(B) at least one compound selected from the group consisting of a silicon-containing compound having at least one long chain hydrocarbon group containing at least 8 carbon atoms in a straight chain part, and a silicon-containing compound having at least one fluorohydrocarbon group in an amount of 0.1 to 30 parts by weight per 100 parts by weight of the polymer (A), which fluorohydrocarbon group is a $C_1–C_{20}$—alkyl group wherein 3–33 hydrogen atoms are replaced by fluorine atoms.

4,963,627

INJECTION MOLDABLE BLENDS OF POLY(ETHERKETONES) AND POLYAMIDE-IMIDES

Granville L. Smyser, Plainfield, and Gary T. Brooks, Naperville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Dec. 30, 1988, Ser. No. 291,966

Int. Cl.[5] C08L 77/00

U.S. Cl. 525—420 **30 Claims**

1. A process for stabilizing the melt viscosity of a polymer blend comprising mixing polyamide-imide and polyaryletherketone with a hydrate which liberates water of hydration at temperatures above melt flow temperatures of polyamide-imide, but below melting points for polyaryletherketone and recovering a product.

4,963,628

COMPOSITIONS OF POLYBENZIMIDAZOLES AND POLYARYLATES

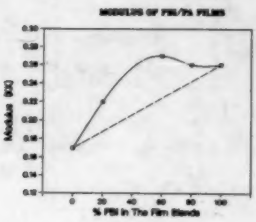
Paul N. Chen, Sr., Gillette; Tai-Shung Chung, Morris Plains, and Paul J. Harget, West Milford, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Aug. 26, 1987, Ser. No. 89,650

Int. Cl.[5] C08L 67/02, 79/06

U.S. Cl. 525—425 **18 Claims**

1. A miscible composition comprising from about 5 parts by weight to about 95 parts by weight of a polyarylate and from about 95 parts by weight to about 5 parts by weight of a polybenzimidazole, total parts by weight of the polyarylate and polybenzimidazole equaling 100.



4,963,629

COPOLYMERS OF UNSATURATED CARBOXYLIC ACIDS AND USE THEREOF

Klaus Driemel; Klaus Bunthoff, both of Duisburg; Helmut Nies, Rheinberg, and Dieter Rohe, Dinslaken, all of Fed. Rep. of Germany, assignors to Grillo-Werke AG, Duisburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 184,424, Apr. 21, 1988, abandoned. This application Aug. 10, 1989, Ser. No. 391,941

Claims priority, application Fed. Rep. of Germany, May 2, 1987, 3714732; Oct. 7, 1988, 3834237

Int. Cl.[5] C08F 220/04, 222/02, 2/10, 8/12

U.S. Cl. 526—200 **16 Claims**

1. A composition of matter comprising a copolymer of a monosaccharide enolate and an unsaturated carboxylic acid.

4,963,630

COPOLYMER OF RESIN ACIDS AND MALEIC ANHYDRIDE

David W. Parker, Holland, Pa., assignor to Union Camp Corporation, Wayne, N.J.

Continuation-in-part of Ser. No. 243,579, Sep. 13, 1988, abandoned, which is a continuation-in-part of Ser. No. 191,935, May 9, 1988, abandoned. This application Apr. 12, 1989, Ser. No. 336,947

Int. Cl.[5] C08F 210/04

U.S. Cl. 526—238.3 **21 Claims**

1. A polymer comprising the product of a copolymerization of monomers consisting essentially of maleic anhydride reactive resin acids present in rosin, or esters thereof, and maleic anhydride, said process being carried out in the presence of an effective amount of at least one free radical initiator, said polymer having a weight average molecular weight of at least about 1200.

4,963,631

POLYMERS

Donald R. Randell, Heaton Mersey, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

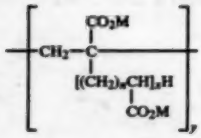
Filed Mar. 13, 1989, Ser. No. 322,608

Claims priority, application United Kingdom, Mar. 22, 1988, 8806802

Int. Cl.[5] C08F 30/04

U.S. Cl. 526—240 **5 Claims**

1. (Co)polymers having the formula (I):



wherein

M is hydrogen, a metal ion or an ammonium cation;

x is 1, 2 or 3;

y is an integer from 2 to 100; and

n is 1, 2 or 3.

4,963,632

MIXED MICELLAR PROCESS FOR PREPARING HYDROPHOBICALLY ASSOCIATING POLYMERS

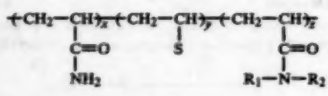
Jan Bock, Bridgewater, and Paul L. Valint, Asbury, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 29, 1988, Ser. No. 291,803

Int. Cl.[5] C08F 30/04

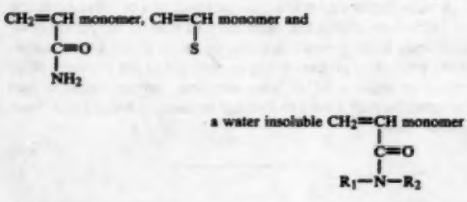
U.S. Cl. 526—240 **9 Claims**

1. A homogeneous micellar free radical polymerization process for the formation of a terpolymer having the structure of:



wherein S is selected from the group consisting of SO_3M, phenyl SO_3M, $CONHC(CH_3)_2CH_2SO_3M$ or COOM; M is selected from the group consisting of Groups IA, IB, IIA and IIB of the Periodic Table of Elements, R_1 is a C_1 to C_{10} alkyl, cycloalkyl or aralkyl group, R_2 is hydrogen or a C_4 to C_{18} alkyl, cycloalkyl or aralkyl group, x is about 10 to about 90 mole %, y is about 0.1 to about 60 mole %, and z is about 0.2 to about 10 mole % which comprises the steps of

(a) forming a mixture of an anionic surfactant, a nonionic surfactant,



under a nitrogen atmosphere;

(b) adding deoxygenated water to said mixture to form a homogeneous reaction solution;

(c) adding free radical initiator to said homogenous reaction solution to initiate polymerization of said monomers;

(d) terpolymerizing said monomers at a sufficient temperature and for a sufficient period of time to form said terpolymer and without the formation of substantial amounts of particulates or phase separation occurring.

4,963,633

BISACRYLATE MONOMERS AND POLYMERS EXHIBITING NONLINEAR OPTICAL RESPONSE

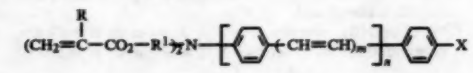
Ronald N. DeMartino, Wayne; Anthony J. East, Madison, and Gordon W. Calundann, North Plainfield, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Division of Ser. No. 135,764, Dec. 21, 1987, Pat. No. 4,922,003. This application Nov. 13, 1989, Ser. No. 434,261

Int. Cl.[5] C08F 20/10, 120/10

U.S. Cl. 526—323.2 **5 Claims**

1. A process for producing a nonlinear optical medium which comprises heating and forming a melt phase medium of a bisacrylate composition corresponding to the formula:



where R is a C_1–C_4 alkyl substituent, R^1 is a divalent C_2–C_{12} alkylene radical, m is an integer with a value of 0–2, n is an integer with a value of 0–1, and X is an electron-withdrawing substituent; subjecting the melt phase to an external field to induce an orientation of aligned molecules in the medium, and forming a solid phase of the molecularly oriented medium while maintaining the external field effect to freeze the molecular orientation in the formed solid phase.

4,963,634

REMOVING FINES FROM MASS RESINS OF POLYVINYLCHLORIDE

David J. DiRienzo, Baton Rouge, La., assignor to The B. F. Goodrich Company, Brecksville, Ohio

Continuation of Ser. No. 81,065, Aug. 3, 1987. This application Feb. 6, 1989, Ser. No. 306,725

Int. Cl.[5] C08F 14/06

U.S. Cl. 526—344.1 **7 Claims**

1. A particulate mass PVC resin substantially free of fines, consisting essentially of:

mass produced air classified surfactant-free normal-sized PVC resin particles having a particle size of generally greater than 75 microns, wherein the amount of said mass produced air classified normal-sized PVC particles having said particle size of at least 75 microns is greater than 99.0 percent by weight, with said mass produced air classified normal-sized PVC resin particles being free of a pericellular membrane.

4,963,635

PROCESSES FOR THE PRODUCTION OF SILICON-CONTAINING POLYIMIDES PRECURSORS, AND THEIR CURED POLYIMIDES LOW IN HYGROSCOPICITY

Kouichi Kunimune, Ichihara, and Yoshiya Kutsuzawa, Yokohama, both of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Feb. 24, 1989, Ser. No. 315,142

Claims priority, application Japan, Feb. 26, 1988, 63-43387

Int. Cl.[5] C08G 77/04

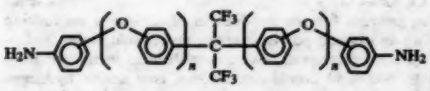
U.S. Cl. 528—26 **5 Claims**

1. A process of producing a silicon-containing polyamide precursor that has a logarithmic viscosity number of 0.05 to 5 dl/g measured at an in-solvent temperature of 30°±0.01° C. with the concentration being 0.5 g/d characterized by reacting A^1 mols of a fluorine-containing diacid anhydride represented by the formula (I) given below, A^2 mols of a diacid anhydride represented by the formula (II) given below, B^1 mols of a fluorine-containing diamine represented by the formula (III) given below, B^2 mols of a diamine represented by the formula (IV) given below, and C mols of an aminosilane represented by the formula (V) given below with the mixing

ratio being in the ranges given by the formulae (VI) to (VIII) given below:

(I)

(II)



(III)

$$H_2N-R^2-NH_2 \quad \text{(IV)}$$

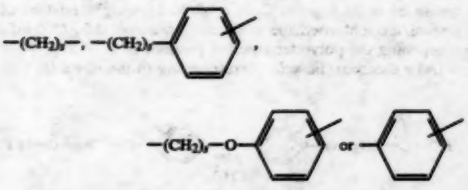
$$NH_2-R^3-SiR^4_{3-k}X_k \quad \text{(V)}$$

$$\frac{A^1+B^1}{A^1+A^2+B^1+B^2+C} \geqq 0.05 \quad \text{(VI)}$$

$$1 \leqq \frac{C}{A^1+A^2-B^1-B^2} \leqq 1.8 \quad \text{(VII)}$$

$$\frac{C}{B^1+B^2+C} \geqq 0.05 \quad \text{(VIII)}$$

wherein R^1 represents a tetravalent carbocyclic aromatic group or heterocyclic group, R^2 represents an aliphatic group that has at least two carbon atoms, an aliphatic group, an araliphatic group, a carbocyclic aromatic group, a heterocyclic group or a polysiloxane group, R^3 represents



wherein s is an integer of 1 to 4, R^4 represents an alkyl group having 1 to 6 carbon atoms, a phenyl group, an alkyl-substituted phenyl group having 7 to 12 carbon atoms, X represents an alkoxy group, an acetoxy group, or halogen, m is 0 or 1, n is 0 or 1, and k is a value represented by $1 \leqq k \leqq 3$.

4,963,636

ADHESION PROMOTERS

Rolf Mülhaupt, Marly, Switzerland, and Hubert Simon, Mulhouse, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 220,339, Jul. 14, 1988, abandoned, which is a continuation of Ser. No. 118,817, Nov. 9, 1987, abandoned. This application Feb. 12, 1990, Ser. No. 479,223

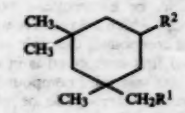
Claims priority, application Switzerland, Nov. 19, 1986, 4618/86

Int. Cl.[5] C08G 77/04

U.S. Cl. 528—28 **1 Claim**

1. A two component adhesive consisting essentially of

(I) a polyfunctional isocyanate compound or an isocyanate terminated polyurethane prepolymer and a compound of formula I



(I)

wherein one of the radicals R^1 or R^2 is —N=C=O and the other is $—NHC(O)S(CH_2)_3Si(OR^3)_3$, wherein R^3 is C_1–C_4 alkyl or phenyl and

(II) as a curing agent, a polyol with the proviso that the ratio of NCO groups to OH groups is less than or equal to 1.02.

4,963,637

ACID CONTAINING ISOCYANATE-TERMINATED PREPOLYMERS, SALT PREPOLYMERS AND POLYMERS THEREOF

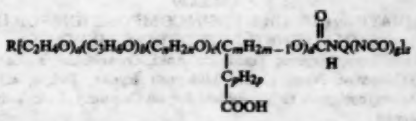
Nigel Barksby, Dunbar, W. Va., assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Jun. 23, 1989, Ser. No. 370,722

Int. Cl.[5] C08G 18/06

U.S. Cl. 528—59 **29 Claims**

1. An acid-containing, isocyanate terminated prepolymer of the formula:



wherein:

R is an initiator radical based on a compound containing Zerewitinoff active hydrogen

a is zero to 175;

b is zero to 175;

c is zero to 175;

d is 1 to 60;

m is 2 to n;

n is 4 to 20;

p is 2 to 10;

Q is an organic radical;

g is 1 to 6;

z is an integer derived from the number of Zerowitinoff active hydrogen atoms on R; and

a+b+c is at least one.

4,963,638

SUPERABSORBENT THERMOPLASTIC COMPOSITIONS AND NONWOVEN WEBS PREPARED THEREFROM

Jose F. Pazos, Roswell; Sharon L. Greene, Alpharetta, and Augusto Rodriguez, Roswell, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 161,073, Feb. 26, 1988, Pat. No. 4,847,141. This application Feb. 23, 1989, Ser. No. 314,688

Int. Cl.[5] D03D 3/00

U.S. Cl. 528—65 **33 Claims**

1. A method of preparing a superabsorbent, thermoplastic polymeric composition which comprises:

(A) reacting a first compound with a second compound at a temperature of from about 50 to about 200 degrees C. for a time sufficient to effect essentially complete reaction; and

(B) reacting with the product from step A a third compound at a temperature of from about 80 to about 200 degrees C. for a time sufficient to obtain a melt flow rate of less than about 1,000 g per 10 minutes;

in which said first compound is a difunctional poly(oxyethylene) having a weight average molecular weight of from

about 5,000 to about 50,000; said second compound is an aliphatic, cycloaliphatic, aromatic, or heterocyclic compound having two functional groups which are reactive with the functional groups of said first compound; the mole ratio of said second compound to said first compound is in the range of from about 2 to about 100; said third compound is an aliphatic, cycloaliphatic, aromatic, heterocyclic, or polymeric compound having two functional groups which are reactive with the functional groups of said second compound; the reaction product of said first compound with said second compound, excluding excess second compound, is from about 86 to about 98 percent by weight of the final composition; and said third compound plus the excess of said second compound are from about 2 to about 14 percent by weight of the final composition;

in which the functional groups of said second compound and said third compound independently are selected from the group consisting of hydroxy, carboxy, amino, epoxy, imino, and isocyanate groups, with the selection of all such functional groups being such that said superabsorbent, thermoplastic polymeric composition contains linkages selected from the group consisting of urethane, amide, ester, and secondary urea linkages; and the melt flow rate is determined at a temperature of 195 degrees C., under a 2.16 kg load, and with an orifice diameter of 2.0955 0.0051 mm.

4,963,639

RADIATION CURABLE RESIN COMPOSITION FOR USE IN MAGNETIC RECORDING MEDIA

Mitsuo Sato, Nagoya; Toshikazu Aoki, Owariasahi; Yukishige Takamatsu, Nagoya, and Hideyasu Ryoke, Tokyo, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Dec. 22, 1987, Ser. No. 136,759

Claims priority, application Japan, Dec. 26, 1986, 61-309342

Int. Cl.[5] C08F *30/02, 20/58*; C08G *18/38*

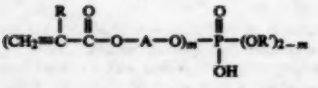
U.S. Cl. 528—72 **4 Claims**

1. A radiation curable resin composition permitting good dispersion of magnetic powders and forming a highly durable curd film, said resin composition consisting essentially of a urethane (meth)acrylate obtained by the reaction of

(A) a hydroxy-containing compound mixture consisting essentially of an amido hydroxy compound (a_1) selected from the group consisting of N-2-hydroxypropylacetamide and an amido hydroxy compound having at least one amido group and more than one isocyanate-reactive hydroxyl group in the molecule, and at least one polyol compound (a_2) selected from polyester polyols, polyether polyols and alkyl polyols, the number of moles (x_1) of the hydroxyl groups present in said amido hydroxy compound (a_1) being from 5 to 80% of the total number of moles of the hydroxyl groups contained in component (A) and the number of moles (x_2) of the hydroxyl groups present in said polyol compound (a_2) being from 95 to 20% of the total number of moles of the hydroxyl groups contained in component (A);

(B) a polyisocyanate compound having two or more isocyanate groups in the molecule;

(C) a phosphoric user of the general formula



where R is hydrogen or methyl group, A is a divalent alcohol residue, R' is hydrogen or an alkyl group of 1 to 4 carbon atoms, and m is 1 or 2, and

(D) a hydroxyl-containing alkyl (meth)acrylate other than component (C),

said urethane (meth)acrylate being further characterized in that, when the number of moles of the hydroxyl groups present in component (A) is represented by X and the number of moles of the isocyanate groups present in component (B) is represented by Y, the ratio of X to Y ranges from 1:1.1 to 1:2, the number of moles (Z) of the hydroxyl groups present in componeints (C) and (D) is not less than (Y-X), and the number of moles of component (C) is between 0.1 (Y-X) and 0.7 (Y-X), both inclusive.

4,963,640

PROCESS AND COMPOSITIONS FOR PRODUCTION OF MOLDINGS

John E. Dewhurst, Macungie, Pa., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Feb. 13, 1989, Ser. No. 310,263

Int. Cl.[5] C08G *18/08, 18/32, 18/43, 18/60*

U.S. Cl. 528—73 **7 Claims**

1. A process for the production of moldings comprising reacting an organic polyisocyanate, an organic active hydrogen containing material having a molecular weight of from 1000 to 8000 and containing at least two active hydrogen groups, and a chain extender in a closed mold, said chain extender comprising the reaction product of

(a) an aromatic diamine which contains at least one non-reactive substituent in the ortho position to a first amino group and at least one other non-reactive substituent in the ortho position to a second amino group, and

(b) a cyclic carboxylic acid dianhydride at a molar ratio of component (a) to component (b) of from 3:1 to 25:1.

4,963,641

POLYESTER WITH IMPROVED GAS BARRIER PROPERTIES FROM CYCLOALKYLIDENE BIS (P-PHENYLENEOXY) DIACETIC ACID

Burns Davis, deceased, late of Kingsport, Tenn. (Bessie A. Davis, executrix), assignor to Eastman Kodak Company, Rochester, N.Y.

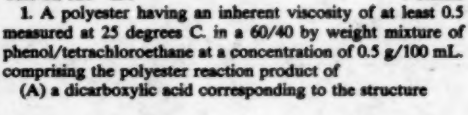
Filed May 30, 1989, Ser. No. 359,181

Int. Cl.[5] C08G *63/123*

U.S. Cl. 528—190 **4 Claims**

1. A polyester having an inherent viscosity of at least 0.5 measured at 25 degrees C. in a 60/40 by weight mixture of phenol/tetrachloroethane at a concentration of 0.5 g/100 mL. comprising the polyester reaction product of

(A) a dicarboxylic acid corresponding to the structure



wherein X is hydrogen or unsubstituted alkyl containing 1–5 carbons and n is an integer in the range of 4 to 10, and

(B) a diol selected from the group consisting of ethylene glycol, 1,4-butanediol and 1,4-cyclohexanedimethanol.

4,963,642

THERMOTROPIC COPOLYESTER AND PROCESS FOR PREPARING IT AND USE THEREOF

Arnaldo Roggero; Ugo Pedretti, both of Milan; Pier L. Magagnini, Rigliose; Enrico Montani; Hassan A. Hakemi, both of Milan; Bruno Brunci, Livorno, and Francesco P. La Mantia, Palermo, all of Italy, assignors to Enitecrche S.p.A., Milan, Italy

Filed May 30, 1989, Ser. No. 358,167

Claims priority, application Italy, Jun. 8, 1988, 20886 A/88

Int. Cl.[5] C08G *63/00, 63/02*

U.S. Cl. 528—190 **12 Claims**

1. Thermoplastic copolyester having a nematic structure of the liquid-crystalline phase, with temperatures of transition from the crystal phase to the nematic mesophase comprised within the range of from 140° to 230° C., containing in its macromolecule units from:

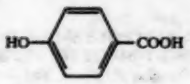
(a) a saturated aliphatic α,ω-bicarboxy acid:

HOOC—$(CH_2)_n$—COOH

wherein n is comprised within the range of from 3 to 8;

(b) 4,4'-dihydroxy-biphenyl;

(c) p-hydroxy-benzoic acid:



(d) 2,6-hydroxy-naphthoic acid:

within the following ratios of said units to one another:

(a)/(b)=1;

[(c)+(d)]/(a)=1–8;

(d)/[(c)+(d)]=0.1–1.

4,963,643

CRYSTALLINE POLYARYLNITRILE ETHER POLYMER

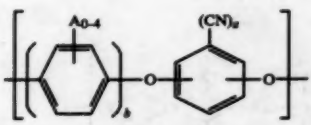
Louis M. Maresca, Belle Mead; Alford G. Farnham, Mendham; Thomas H. Schwab, North Brunswick, and Ulrich A. Steiner, North Plainfield, all of N.J., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 758,561, Jul. 23, 1985, Pat. No. 4,912,192, which is a continuation of Ser. No. 480,737, Mar. 31, 1983, abandoned. This application May 1, 1989, Ser. No. 345,957

Int. Cl.[5] C08G *65/40*

U.S. Cl. 528—211 **3 Claims**

1. A crystalline polyarylnitrile polymer having repeating units of the following formula:



wherein A is independently selected from hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halogen, a is an integer of 1 or 2 and b is an integer of 1 to 3.

4,963,644

PROCESS FOR CRYSTALLIZATION OF POLYETHYLENE NAPHTHALATE

Ben Duh, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 18, 1989, Ser. No. 408,354

Int. Cl.[5] C08G *63/88*

U.S. Cl. 528—272 **19 Claims**

1. A process for crystallizing amorphous polyethylene naphthalate prepolymer which comprises: (1) heating the amorphous polyethylene naphthalate prepolymer to a temperature which is within the range of about 80° C. to about 140° C. in the presence of a stream of an inert gas or under a vacuum for a period of time which is sufficient to devolatilize the amorphous polyethylene naphthalate prepolymer; and (2) subsequently heating the devolatilized polyethylene naphthalate prepolymer to a temperature which is within the range of about 150° C. to about 260° C. while providing agitation to produce the crystallized polyethylene naphthalate prepolymer.

4,963,645

TERMINAL-MODIFIED IMIDE OLIGOMER AND SOLUTION COMPOSITION OF THE SAME

Hiroshi Inoue; Tadao Muramatsu, and Tetsuji Hirano, all of Hirakata, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Aug. 24, 1988, Ser. No. 236,000

Claims priority, application Japan, Aug. 25, 1987, 62-209341; Aug. 25, 1987, 62-209342

Int. Cl.[5] C08G *69/26, 63/00, 2/00, 12/00*

U.S. Cl. 528—342 **42 Claims**

1. A terminal-modified imide oligomer wherein:

said oligomer is produced by reacting an aromatic tetracarboxylic acid, its dianhydride, its ester or its salt containing at least 50 molar % of 2,3,3',4'-biphenyltetracarboxylic acid, its dianhydride, its ester or its salts, a diamine compound, and an unsaturated dicarboxylic acid having an ethylenic or acetylenic unsaturated group or its anhydride in an organic solvent;

said oligomer has an ethylenic or acetylenic unsaturated group as a terminal group and an internal imide bond inside of the oligomer;

said oligomer is soluble in N-methyl-2-pyrrolidone in an amount of not less than 3% by weight at 30° C.; and

said oligomer has a logarithmic viscosity of not more than 1.0, said logarithmic viscosity being measured under the conditions of a concentration of 0.5 g/100 ml N-methyl-2-pyrrolidone and a temperature of 30° C., and has a melting point in the range of 50° to 300° C.

4,963,646

PREPARATION OF AMORPHOUS POLYAMIDES BASED ON AROMATIC DICARBOXYLIC ACIDS AND ON ALIPHATIC DIAMINES FROM UNBALANCED POLYAMIDE PREPOLYMER

Genevieve Galland, Lyons, and Jean Coquard, Grezieu la Varenne, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Oct. 13, 1989, Ser. No. 420,927

Claims priority, application France, Oct. 13, 1988, 88 14299

Int. Cl.[5] C08G *69/28*

U.S. Cl. 528—347 **8 Claims**

1. A process for the preparation of an amorphous (co)polyamide by polycondensing at least one aromatic dicarboxylic acid having from 8 to 18 carbon atoms with at least one linear or branched chain aliphatic diamine, noncontinuously and in bulk melt, comprising (a) preparing two unbalanced prepolymers from such diacid and diamine, or salts thereof, each having a viscosity index ranging from 70 to 96 ml/g, one having an excess of COOH endgroups such that the difference:

$$d1 = EG\ COOH - EG\ NH_2$$

wherein EG COOH is the amount of COOH endgroups and EG NH_2 is the amount of NH_2 endgroups, ranges from 170 to 260 meq/kg, and the other having an excess of NH_2 endgroups such that the difference:

$$d2 = EG\ NH_2 - EG\ COOH$$

also ranges from 170 to 260 meq/kg, next (b) directly homogeneously admixing said two unbalanced prepolymers in weight proportions such that the difference:

$$\Delta EG = \Sigma G\ COOH(prepolymer) - \sigma G\ NH_2\ (prepolymer)$$

ranges from 100 meq/kg to 160 meq/kg, and then (c) postcondensing such two unbalanced prepolymers, in the molten state, in a vented extruder and at an elevated temperature, thereby providing a (co)polyamide polycondensate in an equilibrium state of amidification and having a viscosity index ranging from 100 ml/g to 150 ml/g.

4,963,647

POLYAMIDE-IMIDE POLYMERS HAVING 12-F FLOURINE-CONTAINING LINKING GROUPS

Rohitkumar H. Vora, Westfield, Paul N. Chen, Sr., Morris, both of N.J., and Jeffery S. Devolve, Warrwick, R.I., assignors to Hoechst Celanese Corp., Somerville, N.J.

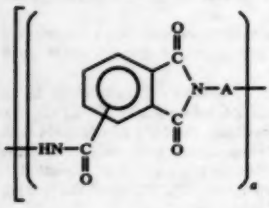
Filed Feb. 27, 1989, Ser. No. 316,254

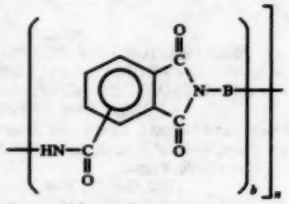
The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.

Int. Cl.[5] C08G 69/26, 69/28

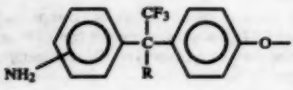
U.S. Cl. 528—350 14 Claims

1. A polyamide-imide polymer containing at least one recurring structural unit of the formula:

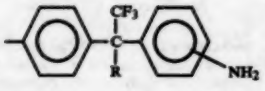




wherein the terms (a) and (b) are equal to the mole fraction of each recurring unit in the polymer chain and (a) ranges from about 0.0 to about 0.95, (b) ranges from about 0.05 to about 1.00, the sum of (a) and (b) being equal to 1, n is a number sufficient to give rise to a polymer having an inherent viscosity of at least about 0.1 dl/g as measured from a solution of the polymer in dimethylacetamide at 25° C. at a polymer concentration of 0.5 weight percent, A is the residuum of a divalent aromatic diamine and B is a residuum of a divalent aromatic diamine having the structure:



(i)



or

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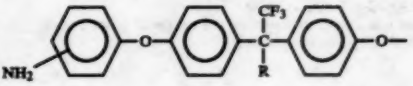
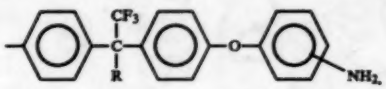


(ii)



4,963,648

POLYAMIDE, POLYIMIDE, AND POLYAMIDE-IMIDE POLYMERS OF DIAMINO-T-BUTYLTOLUENE

David J. Fenoglio, Wheaton; Douglas E. Fjare, and John L. Melquist, both of Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 277,788, Nov. 30, 1988. This application Apr. 9, 1990, Ser. No. 506,217

Int. Cl.[5] C08G 69/26

U.S. Cl. 528—350 4 Claims

1. A resinous condensation polymer of a polytricarboxylic acid compound and an aromatic diprimary amine comprising a diamino-t-butyltoluene.

4,963,649

COPOLYIMIDE AROMATIC SULFONE-FLUOROALIPHATIC RESIN COMPOSITION

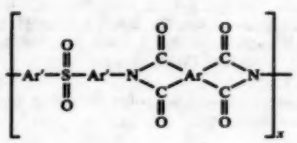
William E. Wright, and David N. Roark, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jul. 20, 1989, Ser. No. 382,216

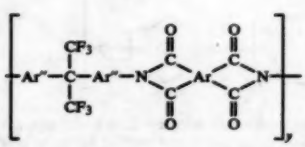
Int. Cl.[5] C08G 8/02, 69/26

U.S. Cl. 528—353 12 Claims

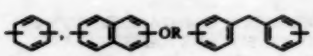
1. A polyamide resin composition comprising randomly distributed units of the formula



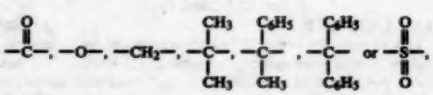
and



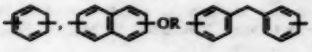
wherein Ar' is



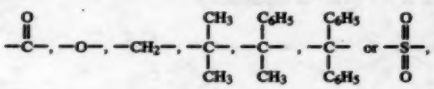
where Z is a chemical bond



Ar'' is



where Z' is the same or different than Z as previously defined and is a chemical bond,



Ar is the tetravalent residue of a tetracarboxylic acid, or acid dianhydride, or di or tetraester thereof and the mole ratio of x:y is from about 1:99 to about 49:51.

4,963,650

PROCESS FOR SEPARATING LOW MOLECULAR WEIGHT COMPOUNDS FROM POLYCAPROAMIDE MELT WITH SUPERHEATED STEAM

Elvina Z. Bokareva; Jelena V. Schinkorenko; Viktor V. Terenko; Larisa A. Nosova; Garri I. Faidel; Sijar N. Nurmuchomedov, all of Moscow; Anatolij V. Beljakov; Ivan M. Vlasov, both of Kalinin, all of U.S.S.R.; Anton Fuerst; Heinz Herrmann, both of Stuttgart; Eckart Pantzer, Freiberg/Neckar; Bernhard Stoehrer, Pleidelsheim; Eberhard Uhland, Bietigheim-Bissingen, and Hans Werner, Stuttgart, all of Fed. Rep. of Germany, assignors to Nautschno-Proisvodstvennoje Objedinenije "Plastmassy" Research Institute of Plastics, Moscow; Allunions-Wissenschafts- und Forschungsinstitut fuer synthetische Fasern (VNIISV), Kalinin, both of, U.S.S.R. and Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Oct. 6, 1989, Ser. No. 417,770

Claims priority, application U.S.S.R., Oct. 6, 1988, 4486831

Int. Cl.[5] C08G *69/46*

U.S. Cl. 528—481 **3 Claims**

1. A process for separating low molecular weight compounds from a crude polycaproamide melt, comprising the step of heat treating a crude polycaproamide melt, containing low molecular weight monomers and oligomers of caproamide and by-products thereof, said heat treatment being effected in vacuo, in an extruder having a plurality of degassing zones, wherein superheated steam is introduced into the polymer melt upstream of each degassing zone in a total amount of 30–150%, relative to the amount of low molecular weight compounds, the low molecular weight compounds and the superheated steam are withdrawn in 2 or more zones, a residual pressure of 2–50 mbar is maintained in all but the final zone and a residual pressure of 5 to 350 mbar is maintained in the final zone, and the melt temperature is either held constant between 240°–280° C or is steadily reduced over the length of the extruder from 280° C to 240° C,

whereby the occurrence of side reactions and dehydration of the melt are substantially eliminated, the molecular weight of the polymer during the heat treatment in vacuo, during transport and subsequent processing remains substantially unchanged, a residual content of low molecular weight compounds of ≦1.8% is achieved, and the operating flexibility of the process is increased.

4,963,651

METHOD TO RECOVER POLY(ARYLENE SULFIDES) WITH VAPORIZED LIQUIDS

Afif M. Nesheiwat, Chatham, N.J., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 224,265, Jul. 25, 1988, abandoned, which is a continuation of Ser. No. 104,613, Oct. 5, 1987, abandoned. This application May 8, 1989, Ser. No. 349,561

Int. Cl.[5] C08G *75/18*

U.S. Cl. 528—483 **13 Claims**

1. A method for recovering a poly(arylene sulfide) from a liquid mixture comprising a liquid-phase poly(arylene sulfide), a polar organic compound and water said method comprising:

(a) contacting said liquid mixture with an effective amount of a vaporized separation agent, wherein said vaporized separation agent is a vaporized liquid which, when in its liquid-phase, is characterized as soluble in said polar organic compound and is a nonsolvent for poly(arylene sulfide) resins, wherein said separation agent is present in an amount necessary to effect a phase separation between said poly(arylene sulfide) and said polar organic compound;

(b) reducing the temperature of said liquid mixture sufficiently to solidify said liquid-phase poly(arylene sulfide) to form a slurry comprising a particulate poly(arylene sulfide); and

(c) recovering said particulate poly(arylene sulfide) from said slurry.

4,963,652

INKS CONTAINING GLYCEROPHOSPHOLIPIDS AND POLYESTERS

Frank J. Tortorici; Kenneth R. Barton, and Lawrence D. Queen, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 27, 1989, Ser. No. 441,784

Int. Cl.[5] C08L *67/02, 67/06*

U.S. Cl. 524—604 **19 Claims**

1. An ink composition or concentrate thereof comprising:

(A) about 4 to 80 weight percent of one or more water-dissipatable or dispersible polymers having carbonyloxy linking groups the linear molecular structure wherein up to 80% of the linking groups are carbonylamido linking groups, the polymer having an inherent viscosity of from about 0.1 to about 1.0 measured in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. and at a concentration of 0.5 gram of polymer in 100 mL of the solvent, the polymer containing substantially equimolar proportions of acid equivalents (100 mole %) to hydroxy and amino equivalents (100 mole %), the polymer comprising the reaction products of reactants selected from (a), (b), (c), and (d), or the ester forming or esteramide forming derivatives thereof, as follows wherein all stated mole percentages are based on the total of all acid, hydroxyl, and amino equivalents being equal to 200 mole %:

(a) at least one difunctional dicarboxylic acid;

(b) from about 4 to about 25 mole % of at least one difunctional sulfomonomer containing at least one metallic sulfonate group or nitrogen-containing nonmetallic sulfonate group attached to an aromatic or cycloaliphatic nucleus wherein the functional groups are hydroxy, carboxyl, or amino;

(c) at least one difunctional reactant selected from a glycol or a mixture of a glycol and diamine having two —NRH groups, the glycol containing two —CH_2—OH groups of which

(1) at least 15 mole % is a poly(ethylene glycol) having the structural formula

$$HOCH_2—CH_2{}_nOH,$$

n being an integer of from 2 to about 20, or

(2) of which from about 0.1 to less than about 15 mole % is a poly(ethylene glycol) having the structural formula

$$HOCH_2—CH_2\text{-}_n OH,$$

n being an integer of between 2 and about 500, and with the proviso that the mole % of said poly(ethylene glycol) within said range is inversely proportional to the quantity of n within said range; and

(d) from none to about 40 mole % of difunctional reactant selected from hydroxycarboxylic acids having one —$C(R)_2$—OH group, aminocarboxylic acids having one —NRH group, amino-alcohols having one —$C(R)_2$—OH group and one —NRH group, or mixtures of said difunctional reactants; wherein each R in the (c) and (d) reactants is a hydrogen atom or an alkyl group of 1 to 4 carbons;

(B) 0 to about 60 weight percent pigment material;

(C) 0 to about 95 weight percent water; and

(D) an effective amount to improve the block and rub resistance, and slide angle of at least one diacyl-glycerophospholipid.

4,963,653

SIALIC ACID-BONDED OCTAPEPTIDE AND PREPARATION THEREOF

Yoshitaka Nagai, Tokyo; Shohei Shibayama, Tokorozawa; Masaaki Numata, Kawagoe; Shoji Yoshimura, Iruma; Makoto Tanaka, Koshigaya; Masayoshi Ito, Kunitachi; Akira Awaya, Yokohama; Hisashi Kobayashi; Hayao Abe, both of Mobara; Yusaku Ishizuka, Yokohama, and Tomoya Ogawa, Musashino, all of Japan, assignors to Meet Corporation and Mitsui Toatsu Chemical, Inc., both of Tokyo, Japan

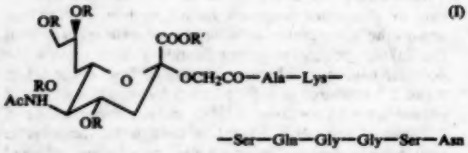
Filed Jun. 28, 1989, Ser. No. 372,708

Claims priority, application Japan, Jun. 28, 1988, 63-159947

Int. Cl.[5] C07K *7/06, 9/00*

U.S. Cl. 530—322 17 Claims

1. A sialic acid-bonded octapeptide represented by the following general formula (I):



(I)

—Ser—Gln—Gly—Gly—Ser—Asn

wherein R represents a hydrogen atom or an acetyl group; and R′ represents a lower alkyl group, an aralkyl group, a hydrogen atom or an alkali metal atom.

4,963,654

PEPTIDE SERINE PROTEASE INHIBITOR

Nobuhiko Katunuma, Tokushima, Japan, assignor to Taisho Pharmaceutical Co., Ltd., Japan

Filed Feb. 13, 1989, Ser. No. 309,161

Int. Cl.[5] C07K *7/10*

U.S. Cl. 530—324 4 Claims

1. A peptide having an amino acid sequence of the following formula:

Ile—Ala—Ala—Cys—Asn—Leu—Pro—Ile—Val—Gln—Gly—Pro—Cys—Arg—Ala—Phe—Ala—Glu—Leu—Leu—Ala—Phe—Asp—Ala—Ala—Gln—Gly—Lys—Cys—Ile—Glu—Phe—Ile—Tyr—Gly—Gly—Cys—Lys—Gly—Asn—Asn—Asn—Lys—Phe—Tyr—Ser—Glu—Pro—Lys—Cys—Lys—Trp—Tyr—Cys—Gly—Val—Pro—Gly—Asp—Gly—Tyr

said peptide having sufficient purity to give a single band on SDS-polyacrylamide gel electrophoresis.

4,963,655

BORON ANALOGS OF AMINO ACID/PEPTIDE PROTEASE INHIBITORS

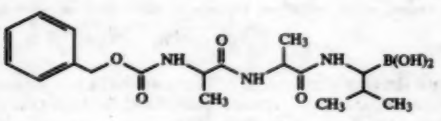
David H. Kinder, and Matthew M. Ames, both of Rochester, Minn., assignors to Mayo Foundation for Medical Education and Research, Rochester, Minn.

Filed May 27, 1988, Ser. No. 199,891

Int. Cl.[5] C07K *5/08*

U.S. Cl. 530—331 3 Claims

1. A compound of the formula:



or a physiologically acceptable salt thereof.

4,963,656

EMULSIFIED COMPOSITIONS CONTAINING ELASTIN HYDROLYSATE

Hiroaki Mitani, Fukuoka, Japan, assignor to Sansho Seiyaku Co., Ltd., Onojo, Japan

Filed May 16, 1988, Ser. No. 194,375

Claims priority, application Japan, May 30, 1987, 62-137071

Int. Cl.[5] A61K *37/12, 9/107;* C07K *15/20*

U.S. Cl. 530—353 8 Claims

1. An emulsified composition comprising an elastin hydrolyzate having a molecular weight not lower than 200,000.

4,963,657

MONOCLONAL ANTIBODIES TO THE LIGHT CHAIN REGION OF HUMAN FACTOR XII AND METHODS OF PREPARING AND USING THE SAME

Robin A. Pixley, Philadelphia, Pa., assignor to Temple University of the Commonwealth System of Higher Education, Philadelphia, Pa.

Filed Jun. 9, 1988, Ser. No. 204,657

Int. Cl.[5] A61K *39/395;* C07K *15/28*

U.S. Cl. 530—387 27 Claims

1. A monoclonal antibody which specifically binds to an antigenic determinant in the light chain region of human factor XII, which determinant is preserved and present in factor XIIa and factor XIIf, said monoclonal antibody having the ability to inhibit the coagulant activity of factor XIIa and the enzyme activity of factor XIIa and factor XIIf.

4,963,658

DNA DETECTION METHOD

Viola T. Kung, Menlo Park; Peter A. Nagainis, San Jose, and Edward L. Sheldon, III, Menlo Park, all of Calif., assignors to Molecular Devices Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 93,361, Sep. 4, 1987. This application Dec. 15, 1988, Ser. No. 285,895

Int. Cl.[5] C07 *15/00;* G01N *33/566;* C12Q *1/68;* C12N *11/02*

U.S. Cl. 530—406 6 Claims

1. A conjugate comprising a high affinity single-stranded DNA binding protein (BP) covalently linked to a detectable label (dl), wherein said conjugate is capable of binding with high affinity via said BP directly to DNA to be detected.

4,963,639

FIBER-REACTIVE DYES CONTAINING CHROMOPHORIC SYSTEM BOUND TO A BRIDGING MEMBER CONSISTING OF TWO OR THREE TRIAZINYL RADICALS

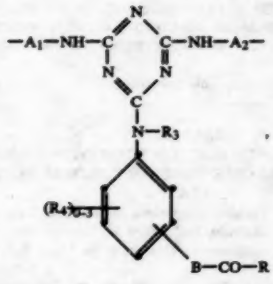
Athanassios Tzikas, Prattein, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 14, 1989, Ser. No. 323,455
Claims priority, application Switzerland, Mar. 16, 1988, 999/88
Int. Cl.[5] C09B 62/00, 62/04, 62/44, 62/465
U.S. Cl. 534—618 21 Claims

1. A reactive dye of the formula

(1)

in which D_1 and D_2, independently of one another, are each a radical of a monoazo, polyazo, metal complex azo, anthraquinone, phthalocyanine, formazan, azomethine, dioxazine, phenazine, stilbene, triphenylmethane, xanthene, thioxanthone, nitroaryl, naphthoquinone, pyrenequinone or perylenetetracarbimide dye; R_1, R_2, B_1 and B_2, independently of one another, are hydrogen or alkyl having 1 to 4 carbon atoms, which is unsubstituted or substituted by halogen, hydroxyl, cyano, C_1–C_4alkoxy, C_1–C_4alkoxycarbonyl, carboxyl, sulfamoyl, sulfo or sulfato; X is fluorine, chlorine, bromine, sulfo, C_1–C_4alkylsulfonyl, phenylsulfonyl or carboxypyridinium, and E is a radical of the formula

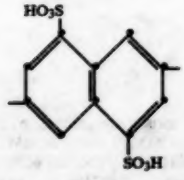


(2)

in which A_1 and A_2, independently of one another, are each a radical of the formula

(3a)

(3b)



(3c)

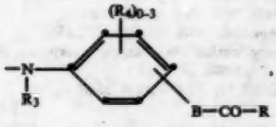
-continued

or

(3d)

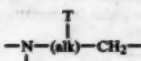
or

X is a radical of the formula

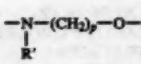


(4)

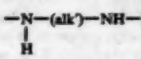
and E is a radical of the formula (3*a*), (3*b*), (3*c*) or (3*d*); and R_3 is hydrogen or alkyl having 1 to 4 carbon atoms, which is unsubstituted or substituted by halogen, hydroxyl, cyano, C_1–C_4alkoxy, C_1–C_4alkoxycarbonyl, carboxyl, sulfamoyl, sulfo or sulfato; R_4 and R_5, independently of one another, are 0 to 3 substituents from the group consisting of C_1–C_4alkyl, C_1–C_4alkoxy, halogen, carboxyl and sulfo; B is a direct bond or $—(CH_2)_n—$ or $—O—(CH_2)_n—$, n is 1 to 6; R is a radical of the formula



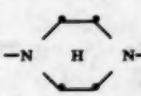
(5a)



(5b)

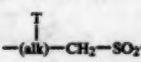


(5c)



(5d)

Z is β-sulfatoethyl, β-thiosulfatoethyl, β-phosphatoethyl, β-acyloxyethyl, β-halogenoethyl or vinyl; alk is alkylene having 1 to 6 carbon atoms or branched isomers thereof; T is hydrogen, chlorine, bromine, fluorine, hydroxyl, sulfato, alkanoyloxy having 2 to 4 carbon atoms, cyano, carboxyl, alkoxycarbonyl having 1 to 5 carbon atoms, carbamoyl, or $—SO_2—Z$ in which Z is as defined above; V is hydrogen or alkyl having 1 to 4 carbon atoms, which is unsubstituted or substituted by carboxyl, sulfo, carbamoyl, N-methylcarbamoyl, N-ethylcarbamoyl, N,N-dimethylcarbamoyl, N,N-diethylcarbamoyl, cyano, acetyl, propionyl, butyryl, methoxycarbonyl, ethoxycarbonyl, propyloxycarbonyl, sulfamoyl, N-methylsulfamoyl, N-ethylsulfamoyl, N,N-dimethylsulfamoyl, N,N-diethylsulfamoyl, methylsulfonyl, ethylsulfonyl, propylsulfonyl, alkoxy having 1 to 2 carbon atoms, halogen or hydroxyl; or is



in which Z, alk and T are as defined above; R' is hydrogen or C_1–C_6alkyl; alk', independently of one another, is poly-

methylene having 2 to 6 carbon atoms or branched isomers thereof; and m is 1 to 6, p is 1 to 6 and q is 1 to 6.

4,963,660

PROCESS FOR THE REDUCTION OF HEAVY METAL IONS IN EXCESS FROM AQUEOUS SYNTHESIS SOLUTIONS OF WATER SOLUBLE HEAVY METAL COMPLEX DYESTUFFS

Uwe Mrotzeck, Kelkheim; Peter Mischke, Bad Soden am Taunus; Günther Schwaiger, Frankfurt am Main; Werner Russ, Hofheim am Taunus, and Manfred Sittig, Kriftel, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 30, 1988, Ser. No. 238,359

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729322; Jul. 29, 1988, 3825815

Int. Cl.[5] C09B *45/00, 67/00, 62/503, 62/04*

U.S. Cl. 534—618 **7 Claims**

1. A process for the reduction of heavy metal ions in the synthesis of a water-soluble heavy metal complex dyestuff having a fiber-reactive group, which comprises carrying out the removal of the excess heavy metal ions by precipitating them as an essentially water-insoluble heavy metal salt from the aqueous synthesis solution by means of a compound, or a combination of these compounds, selected from sodium sulfide, 2-amino-benzoic acid or its water-soluble salt and trimercapto-s-triazine or its water-soluble salt at a pH in the range of from 4 to 7 and at a temperature between 10° and 100° C., or carrying out the removal by means of an ion-exchanger containing sulfo or carboxy groups or both as exchanging groups at a pH in the range of from 4 to 7 and at a temperature from 10° to 30° C.

4,963,661

WATER SOLUBLE NAPHTHYLAZOPYRAZOLONE DYESTUFFS HAVING FIBER-REACTIVE GROUPS OF THE VINYLSULFONE SERIES

Horst Tappe, Dietzenbach; Dieter Oehme, Florsheim am Main; Ludwig Schläfer, Kelkheim, and Werner H. Russ, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

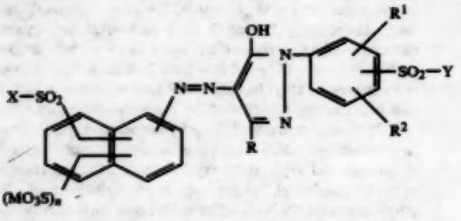
Filed May 24, 1988, Ser. No. 198,136

Claims priority, application Fed. Rep. of Germany, May 26, 1987, 3717667

Int. Cl.[5] C09B *62/51;* D06P *1/384, 3/66*

U.S. Cl. 534—642 **13 Claims**

1. A water-soluble monoazo compound according to the formula



in which:

M is hydrogen or an alkali metal;

n is the number zero or 1;

R^1 is hydrogen, methyl, ethyl, methoxy, ethoxy, chlorine, bromine, carboxy or sulfo;

R^2 is hydrogen, methyl, ethyl, methoxy, ethoxy, chlorine or bromine;

R is carboxy or carbalkoxy having 2 to 5 carbon atoms; X is β-thiosulfatoethyl or β-sulfatoethyl or

X is vinyl in which case, however, n must be 1, and

Y is β-thiosulfatoethyl or β-sulfatoethyl or

Y is vinyl in which case, however, n must be 1.

4,963,662

FLUORINATED NUCLEOSIDES AND METHOD FOR TREATING RETROVIRUS INFECTIONS THEREWITH

Eckart Matthes; Christine Lehmann; Dieter Scholz; Martin von Janta-Lipinski; Klaus Gaertner; Peter Langen, and Hans-Alfred Rosenthal, all of Berlin, German Democratic Rep., assignors to Akademie der Wissenschaften der DDR, Berlin, German Democratic Rep.

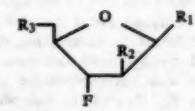
Continuation-in-part of Ser. No. 65,952, Jun. 24, 1987, abandoned. This application Jul. 15, 1988, Ser. No. 223,677

Claims priority, application German Democratic Rep., Jul. 24, 1986, 2928263; May 8, 1987, 3025732; Jun. 3, 1987, 3034896

Int. Cl.[5] C07H *19/06;* A61K *31/70*

U.S. Cl. 536—23 **8 Claims**

1. A method for treating AIDS, which comprises administering to a patient in need therefor a pharmaceutical composition comprising a therapeutically effective amount of a compound having the formula



(I)

wherein:

R_1 is an adenine, cytosine, guanine, thymine, uracil, 5-substituted uracil, 5-substituted cytosine derivative, 2-fluoroadenine, 2,6-diaminopurine, 2-aminopurine, 6-thioguanine, or 7-deazadenine group;

R_2 is H, or a OH group;

R_3 is a OH, O-acyl, O-palmitoyl group, or phosphates (as free acid, or its alkali, ammonium or alkyl ammonium salts), or any other precursor group for the hydroxyl group;

or a physiologically acceptable salt thereof.

4,963,663

GENETIC IDENTIFICATION EMPLOYING DNA PROBES OF VARIABLE NUMBER TANDEM REPEAT LOCI

Raymond L. White; Yusuke Nakamura, both of Salt Lake City; Peter O'Connell, Midvale, and Mark F. Leppert, Salt Lake City, all of Utah, assignors to University of Utah, Salt Lake City, Utah

Continuation-in-part of Ser. No. 288,835, Dec. 23, 1988, abandoned, which is a continuation-in-part of Ser. No. 282,141, Dec. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 157,962, Feb. 18, 1988, abandoned. This application Feb. 8, 1989, Ser. No. 307,820

Int. Cl.[5] C07H *21/04;* C12Q *1/68;* G01N *33/50*

U.S. Cl. 536—27 **38 Claims**

32. A clone set which comprises the clones pYNH24, pCMM6, pCMM66, cCMM77, pCMM86, pMLJ14, cMLJ205, pYNZ22, pJCZ3.1, pJCZ16.2, pJCZ67, pYNZ21, pCMM101, cEFD64, cEFD52, pEFD139, pEFD126.3, pTHH33,

pTHH59, cMHZ47, pMHZ10, pMHZ13, cYNA13, cYNA4, cKKA39, pMCT118, pCMI327, pEKMDA2I, pRMU3, pMCOB17, CTBQ7, nucleic acid fragments capable of hybridizing to the insert and nucleic acid fragments capable of hybridizing to the insert to the single locus specified thereby.

4,963,664

PROCESSES FOR THE PREPARATION OF AMIDES AND AMINES FROM A MATERIAL HAVING CARBOXYL-CONTAINING POLYSACCHARIDES AND PRODUCTS THEREFROM

Manasur Yalpani, and Magdy M. Abdel-Malik, both of Kirkland, Canada, assignors to Domtar Inc., Montreal, Canada

Division of Ser. No. 201,438, Jun. 2, 1988. This application Oct. 26, 1989, Ser. No. 426,657

Int. Cl.[5] C07H *5/00, 3/00;* C08B *15/00;* C07K *15/00*

U.S. Cl. 536—18.7 **31 Claims**

1. A process for the amidation of a material having at least one carboxyl-containing polysaccharide, comprising:

reacting in a solvent said material having at least one carboxyl-containing polysaccharide with an ammonium donor having the general formula >NH, to convert the carboxyl groups of said carboxyl-containing polysaccharide, into amido groups.

4,963,665

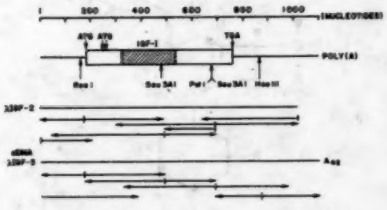
HUMAN PREPROINSULIN-LIKE GROWTH FACTOR I

Peter S. Rotwein, St. Louis, and Gwen G. Krivi, Olivette, both of Mo., assignors to Washington University, St. Louis, Mo.

Continuation-in-part of Ser. No. 816,662, Jan. 7, 1986, abandoned. This application Nov. 20, 1986, Ser. No. 929,671

Int. Cl.[5] C07H *21/04;* C12N *15/00*

U.S. Cl. 536—27 **18 Claims**



1. A synthetic DNA sequence encoding a preproinsulin-like growth factor-I protein comprising the sequence of amino acids shown in FIG. 2.

4,963,666

MATERIAL OF POLYSACCHARIDES CONTAINING CARBOXYL GROUPS, AND A PROCESS FOR PRODUCING SUCH POLYSACCHARIDES

Tomas Mälson, Uppsala, Sweden, assignor to Pharmacia AB, Uppsala, Sweden

PCT No. PCT/SE87/00272, § 371 Date Jan. 27, 1988, § 102(e) Date Jan. 27, 1988, PCT Pub. No. WO87/07898, PCT Pub. Date Dec. 30, 1987

PCT Filed Jun. 9, 1987, Ser. No. 145,780

Claims priority, application Sweden, Jun. 18, 1986, 8602705-9

Int. Cl.[5] C08B *37/00, 37/08*

U.S. Cl. 536—55.1 **7 Claims**

1. A process for the production of crosslinked polysaccharides containing carboxyl groups which comprises

(a) in a first step contacting a polysaccharide containing carboxyl groups with a bi- or polyfunctional epoxide so as to obtain epoxy-activation of said polysaccharide without crosslinking of said polysaccharide,

(b) in a second step removing any epoxide that is not bound to said activated but uncrosslinked polysaccharide, and

(c) in a third step subjecting the activated but uncrosslinked polysaccharide of step (b) to drying conditions until said epoxy-activated polysaccharides do become crosslinked.

4,963,667

IVERMECTIN DERIVATIVE COMPOUNDS AND PROCESS FOR PREPARING THE SAME

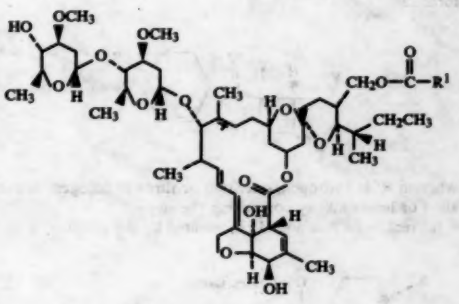
Shuet-Hing L. Chiu, Westfield; Josephine R. Carlin, North Brunswick, and Rae Taub, Metuchen, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 119,454, Nov. 10, 1987, abandoned. This application Dec. 19, 1989, Ser. No. 452,641

Int. Cl.[5] C07H *17/08*

U.S. Cl. 536—7.1 **3 Claims**

1. An ivermectin derivative compound having the structure:



wherein R^1 is a straight chain or branched C_2–C_{20} fatty acid residue.

4,963,668

WELAN GUM IN CEMENT COMPOSITIONS

Floyd L. Allen, Escondido; Glen H. Best, San Diego, and Thomas A. Lindroth, Spring Valley, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 181,844, Apr. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 47,748, May 7, 1987, abandoned. This application Jun. 14, 1989, Ser. No. 366,063

Int. Cl.[5] C08B *37/00;* C07H *1/00*

U.S. Cl. 536—114 **2 Claims**

1. A low viscosity welan gum having a 5% (wt.) aqueous solution viscosity of 100 cP as measured on a Brookfield LVT viscometer, at 25° C., spindle 2, 60 rpm.

4,963,669

PURIFICATION OF TELLURAPYRYLIUM DYES

Michael R. Detty, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 27, 1989, Ser. No. 371,960

Int. Cl.[5] C07D *421/06*

U.S. Cl. 540—1 **15 Claims**

1. A process for upgrading the purity of an unsymmetrical tellurapyrylium dye, said dye having an tellurapyrylium nucleus at one end of a methine-type bridge and a pyranyl, thiapyranyl, or selenapyranyl nucleus at the other end of said bridge, by separating said dye from a symmetrical pyrylium, thiapyrylium, selenapyrylium, or tellurapyrylium analog of said dye;

said dye and said analog comprising a mixture wherein said dye is at least about 50 mole percent or greater,

said process comprising contacting a solution of said mixture of said dye and said analog in an inert organic solvent with a halogen, whereby a tellurium(IV) derivative of said dye

is formed, precipitating said derivative from the reaction mixture thereby produced by fractional crystallization thereby leaving impurities in solution, and reducing said derivative with a reducing agent to reform said dye.

4,963,670

PREPARATION OF AZETIDINONES VIA NOVEL PROTECTED INTERMEDIATES

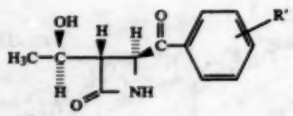
Samuel Chackalamannil, W. Paterson, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 127,844, Dec. 2, 1987, Pat. No. 4,827,006, which is a division of Ser. No. 839,307, Mar. 13, 1986, Pat. No. 4,740,595. This application Nov. 28, 1988, Ser. No. 277,084

Int. Cl.[5] C07D *205/08*; C07B *51/00, 37/10*

U.S. Cl. 540—200 **2 Claims**

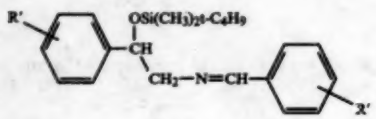
1. A method for producing a compound represented by the formula



I

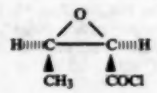
wherein R′ is hydrogen, one, two or three of halogen, lower alkyl or lower alkoxy comprising the steps

(a) reacting a compound represented by the formula



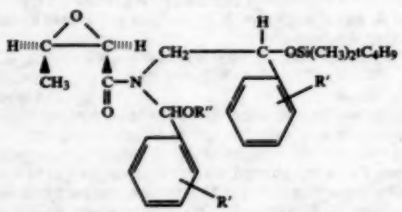
13

wherein each R′ is independently as defined herein for compound I, with a compound represented by the formula



14

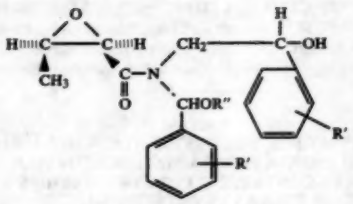
followed by the addition of an organic base, then an anhydrous alcohol selected from methanol, ethanol, a phenol and allyl alcohol, to produce a compound represented by the formula



15

wherein each R′ is as defined herein for compound I and R″ is methyl, ethyl, allyl or a phenyl;

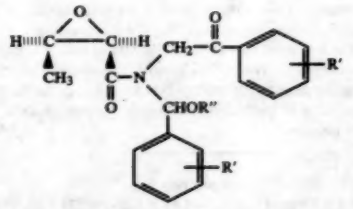
(b) reacting the compound produced in step (a) with tetra-n-butylammonnium fluoride to produce a compound represented by the formula



6

wherein R′ and R″ are as defined herein for compound 15;

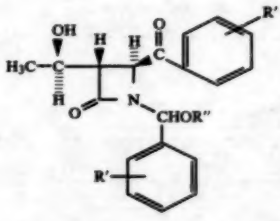
(c) reacting the compound produced in step (b) with pyridinium chlorochromate to produce a compound represented by the formula



7

wherein each R′ and R″ is as defined herein for compound 15;

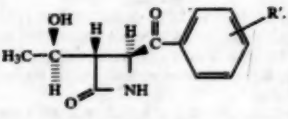
(d) cyclizing the compound produced in step (c) by reacting with a strong based to produce a compound represented by the formula



8

wherein each R′ and R″ is as defined herein for compound 15;

(e) deprotecting the nitrogen of the compound produced in step (d) by reacting with a dilute mineral acid to produce a compound represented by the formula



I

4,963,671

PROCESS FOR RESOLVING CHIRAL INTERMEDIATES USED IN MAKING CALCIUM CHANNEL BLOCKERS

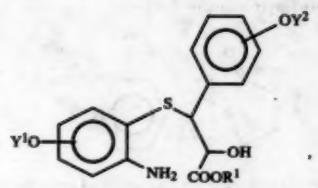
John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 20, 1989, Ser. No. 438,136

Int. Cl.[5] C07D *281/10*

U.S. Cl. 540—491 **14 Claims**

1. A process for preparing the (+)-threo isomer by resolution of its racemic mixture of a substrate of the formula



wherein Y^1 and Y^2 are each independently lower alkyl and R^1 is hydrogen or lower alkyl, which comprises:

(a) treating the racemic threo mixture of the substrate with a chiral acid in an organic solvent; and

(b) isolating the (+)-threo isomer.

4,963,672

PREPARATION OF CAPROLACTAM

Franz Merger, Frankenthal; Rolf Fischer, Heidelberg; Wolfgang Harder, Weinheim; Claus-Ulrich Priester, Ludwigshafen, and Uwe Vagt, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 12, 1989, Ser. No. 448,899

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843791

Int. Cl.[5] C07D *201/08*

U.S. Cl. 540—538 17 Claims

1. A process for preparing caprolactam, comprising the following steps:

(a) reacting a 5-formylvaleric ester with liquid ammonia as reaction medium and hydrogen in the presence of a ruthenium catalyst in liquid phase at from 80° to 140° C. under a hydrogen partial pressure of from 40 to 100 bar,

(b) replacing the reaction medium ammonia by an aromatic hydrocarbon having a boiling point of from 80° to 240° C. which is liquid under the reaction conditions,

(c) heating the resulting mixture in liquid phase under superatmospheric pressure at 230°–350° C. to form caprolactam, and

(d) isolating caprolactam from the resulting reaction mixture.

4,963,673

PREPARATION OF CAPROLACTAM

Franz Merger, Frankenthal; Rolf Fischer, Heidelberg, and Claus-Ulrich Priester, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 12, 1989, Ser. No. 448,902

Int. Cl.[5] C07D *201/08*

U.S. Cl. 540—538 10 Claims

1. A process for preparing caprolactam, which comprises heating a 6-aminocaproic ester in liquid phase in the presence of water to 230°–350° C. under superatmospheric pressure in a reaction medium comprising a liquid aromatic hydrocarbon having a boiling point of from 80° to 240° C. which is inert under reaction conditions, and isolating caprolactam from the reaction mixture.

4,963,674

PURIFICATION OF CYANURIC ACID

Robert W. Mason, Lake Charles, and Thomas C. Parker, Sulphur, both of La., assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 164,671, Mar. 7, 1988, abandoned. This application Dec. 21, 1989, Ser. No. 454,653

Int. Cl.[5] C07D *251/32*

U.S. Cl. 544—192 15 Claims

1. A process for the purification of crude cyanuric acid containing aminotriazine compounds as impurities which comprises digesting the crude cyanuric acid in an aqueous solution containing low concentrations of a mineral acid selected from the group consisting of sulfuric acid, nitric acid, hydrochloric acid, and phosphoric acid, at a temperature in the range of from about 120° C. and about 220° C. and autogenous pressures, wherein the stoichiometric ratio of mineral acid to aminotriazine compounds is less than 1, to produce a slurry of purified cyanuric acid in an acid depleted ammonium salt solution.

4,963,675

SUBSTANTIALLY PURE ISOCYANURATE/POLYISOCYANATES

Jean Robin, Lyons, and Andre Blind, Caluire, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Division of Ser. No. 127,707, Dec. 2, 1987, Pat. No. 4,864,025. This application Mar. 29, 1989, Ser. No. 330,186

Claims priority, application France, Dec. 2, 1986, 86 17012

Int. Cl.[5] C07D *251/30*

U.S. Cl. 544—222 9 Claims

1. A process for purifying a cyclotrimerized diisocyanate comprising an isocyanurate/polyisocyanate, said isocyanurate/polyisocyanate containing no more than about 0.03% by weight of residual diisocyanate monomer and no more than about 1% by weight of diisocyanate dimer, comprising extracting diisocyanate monomer and diisocyanate dimer from a cyclotrimerized diisocyanate comprising at least 0.1% by weight of diisocyanate monomer and at least 2% of diisocyanate dimer, with an inert gas in either the liquid or supercritical state, said inert gas being capable of extracting diisocyanate monomer and diisocyanate dimer.

4,963,676

DI-SUBSTITUTED PHTHALAZINES

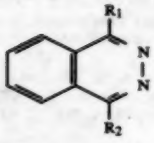
Lucjan Strekowski, Stone Mountain; Maria Mokrosz, Decatur, and Donald B. Harden, Atlanta, all of Ga., assignors to Georgia State University Foundation, Inc., Atlanta, Ga.

Division of Ser. No. 153,998, Feb. 9, 1988, Pat. No. 4,929,726. This application Aug. 30, 1989, Ser. No. 400,502

Int. Cl.[5] C07D *237/30, 237/26*

U.S. Cl. 544—237 3 Claims

1. A phthalazine of the structure



wherein R_1 is chloro and R_2 is selected from the group consisting of thien-2-yl and 2,2'-bithiophen-5-yl.

4,963,677

HETEROCYCLIC LACTAM COMPOUNDS

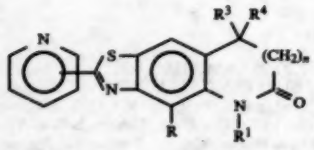
Lawrence Sellin; Reijo J. Backstrom, both of Helsinki; Kalevi E. Heinola, Jarvenpaa; Erkki J. Honkanen, Vantaa; Tord K. W. Langenskiold, Espoo; Irma O. Ojala, Helsinki; Aino K. Pippuri, and Jarmo J. Pystynen, both of Espoo, all of Finland, assignors to Orion Corporation Ltd., Espoo, Finland

Continuation-in-part of Ser. No. 222,754, Jul. 22, 1988, abandoned, which is a continuation of Ser. No. 139,539, Dec. 30, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 268,450

Int. Cl.[5] C07D *239/70, 471/04*

U.S. Cl. 544—247 **6 Claims**

1. A compound of the formula



and pharmaceutically acceptable salts thereof, wherein n=0 or 1, R is hydrogen or halogen, R^1 is hydrogen, or where R and R^1 combine to form a

group,

and R^3 and R^4 are hydrogen or C_{1-6}-alkyl.

4,963,678

PROCESS FOR LARGE-SCALE PRODUCTION OF BMY 21502

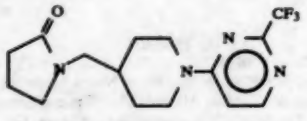
Gary D. Madding; Joseph L. Minielli, both of Evansville, Ind., and Ronald J. Mattson, Meriden, Conn., assignors to Bristol-Myers Squibb Co., New York, N.Y.

Filed Oct. 27, 1989, Ser. No. 427,546

Int. Cl.[5] C07D *401/14*

U.S. Cl. 544—335 **6 Claims**

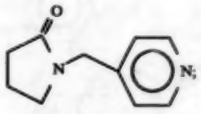
1. An improved process suitable for large-scale production of BMY 21502.



BMY 21502

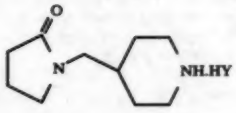
comprising the steps of

(a) adding a mixture of 2-pyrrolidinone and 4-halomethylpyridine to a suspension of sodium hydride in N,N-dimethylformamide at about 15° to 20° to form 1-(4-pyridinylmethyl)-2-pyrrolidinone (IV)



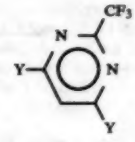
IV

(b) catalytically hydrogenating an acidified aqueous solution of IV giving III



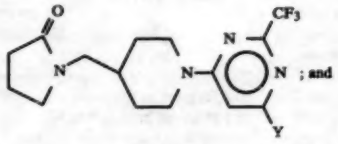
III

wherein Y is chloride, bromide or iodide, and basifying the aqueous solution and adding V



V

to produce intermediate II



II

(c) converting II by catalytic hydrogenolysis to the product BMY 21502.

4,963,679

PROCESS FOR PREPARING BIS (3,5-DIOXOPIPERAZINYL) ALKANES OR ALKENES

Chin-Yun J. Tu; George W. Clark, both of Columbus, Ohio, and Giampietro Borsotti, Novara, Italy, assignors to Erbamont, Inc., Dublin, Ohio

Filed Feb. 17, 1988, Ser. No. 157,195

Int. Cl.[5] C07D *241/18*

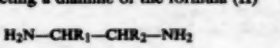
U.S. Cl. 544—357 **10 Claims**

1. A process for preparing a compound of the formula (I)

(I)

wherein R_1 and R_2 are individually selected from the group consisting of hydrogen and methyl or R_1 and R_2 together represent an ethylene bridge group comprising:

reacting a diamine of the formula (II)



(II)

where R_1 and R_2 are defined as above with formaldehyde and an alkaline metal cyanide at a pH in the range of about 0 to 2 to produce a tetranitrile of the formula (III):

$$(NCCH_2)_2N—CHR_1—CHR_2—N(CH_2CN)_2 \quad (III)$$

hydrating said tetranitrile to yield an acid addition salt of a tetraamide of the formula (IV):

$$(H_2NOCCH_2)_2N—CHR_1—CHR_2—N(CH_2CONH_2)_2.2HX \quad (IV)$$

where R_1 and R_2 are defined as in formula (I) and X is an acid anion selected from the group consisting of fluoride, chloride, bromide and sulfate; and

reacting said acid addition salt of said tetraamide in a cyclization reaction to yield said compound of the formula (I).

4,963,680

PIPERAZINE DERIVATIVES AND THEIR PREPARATION PROCESS

Philippe Manoury, Verrieres le Buisson; Jean Binet, Breuillet; Daniel Obitz, Fontenay aux Roses; Gerard Defosse, Paris; Elisabeth Dewitte, Saint Gratien, and Corinne Veronique, Villejuif, all of France, assignors to Synthelabo, Paris, France

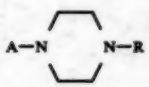
Filed Aug. 2, 1989, Ser. No. 388,374

Claims priority, application France, Aug. 3, 1988, 88 10481

Int. Cl.[5] C07D 295/08, 295/10

U.S. Cl. 544—395 **3 Claims**

1. A compound, of the formula



in which

R is hydrogen or a straight or branched (C_{1-4})alkoxycarbonyl group; and

A is a 7-methoxy-1-naphthalenyl, 6-methoxy-2,3-dihydro-1-(1H)-indenyl or 7-methoxy-1,2,3,4-tetrahydro-1naphthalenyl group, or an optically active isomer thereof, or a salt thereof.

4,963,681

PROCESS FOR SYNTHESIS OF AMINOMETHYLENE PHOSPHONOALKYLPHOSPHINATES

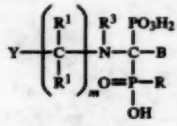
Frank H. Ebetino, Norwich, N.Y., assignor to Norwich Eaton Pharmaceuticals, Inc., Norwich, N.Y.

Filed Jul. 6, 1987, Ser. No. 69,663

Int. Cl.[5] C07F 9/58

U.S. Cl. 546—22 **9 Claims**

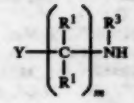
1. A process for making aminomethylene phosphonoalkylphosphinate compounds having the chemical structure:



said process comprising:

(1) heating a substantially anhydrous mixture comprising:

(a) an amine having the chemical structure:



wherein

(i) m is an integer from 0 to 10;

(ii) (a) each R^1 is independently selected from the group consisting of hydrogen; fluoro; lower alkyl; unsubstituted amino, and the C_1–C_6 amides thereof; amino substituted with one lower alkyl group, and the C_1–C_6 amides thereof; hydroxy, —CO_2H and the pharmaceutically-acceptably salts, the C_1–C_6 esters, and the substituted and unsubstituted amides thereof; ether having a lower alkyl group; —PO_3H_2 and the pharmaceutically-acceptable salts thereof; and nitro; or

(b) two R^1's on the same carbon atom are =0; or =NR^9, where R^9 is unsubstituted lower alkyl, or hydrogen when there is another nitrogen atom attached to the same carbon atom as the =NR^9 moiety; or two R^1's on adjacent carbon atoms may be replaced by an additional bond between the carbon atoms;

(c) except that R^1's are not such that there is a halogen and an oxygen or sulfur or nitrogen singly bonded to the same carbon atom or such that two of an oxygen or sulfur or nitrogen are singly bonded to the same carbon atom;

(iii) R^3 is selected from the group consisting of hydrogen and lower alkyl; and

(iv) Y is pyridyl or substituted pyridyl;

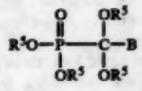
(b) an ester of an alkyl phosphite having the chemical structure:

wherein

(i) R is selected from the group consisting of hydrogen, and unsubstituted and substituted alkyl; and

(ii) R^5 is alkyl; and

(c) an ester of an phosphonate acetal having the chemical structure:



wherein

(i) B is selected from the group consisting of hydrogen; fluoro; unsubstituted and substituted lower alkyl; unsubstituted and substituted cycloalkyl having from 3 to 7 atoms in the ring; unsubstituted and substituted phenyl; and —CO_2H, and the pharmaceutically-acceptable salts, the C_1–C_6 esters, and the substituted and unsubstituted amides thereof; and

(ii) R^5 is alkyl; and

(2) then adding water to said mixture.

4,963,682

NOVEL RADIOPHARMACEUTICALS AND CHELATING AGENTS USEFUL IN THEIR PREPARATION

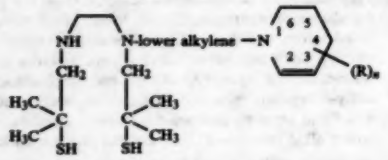
Nicholas S. Bodor, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Continuation of Ser. No. 850,299, Mar. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 632,383, Jul. 19, 1984, abandoned. This application Aug. 21, 1987, Ser. No. 89,009

Int. Cl.[5] C07D *211/82, 211/84, 211/90, 211/70*

U.S. Cl. 546—338 **7 Claims**

1. A compound having the structural formula



wherein the dotted line indicates the presence of a double bond in either the 4 or 5 position of the dihydropyridine ring; n is zero, one or two; and each R is independently selected from the group consisting of halo, C_1–C_7 alkyl, C_1–C_7 alkoxy, C_2–C_8 alkoxycarbonyl, C_2–C_8 alkanoyloxy, C_1–C_7 haloalkyl, C_1–C_7 alkylthio, C_1–C_7 alkylsulfinyl, C_1–C_7 alkylsulfonyl, —CH=NOR‴ wherein R‴ is H or C_1–C_7 alkyl, and —CONR′R″ wherein R′ and R″, which can be the same or different, are each H or C_1–C_7 alkyl.

4,963,683

PROCESS FOR PREPARING POLYOXA TETRACYCLIC COMPOUNDS

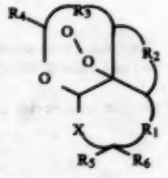
Mitchell A. Avery, Palo Alto, and Clive Jennings-White, Mountain View, both of Calif., assignors to SRI International, Menlo Park, Calif.

Continuation of Ser. No. 943,555, Dec. 18, 1986, abandoned. This application Feb. 15, 1989, Ser. No. 312,376

Int. Cl.[5] C07D *491/18*

U.S. Cl. 546—63 **9 Claims**

1. A process for preparing a polyoxa tetracyclic compound of the formula



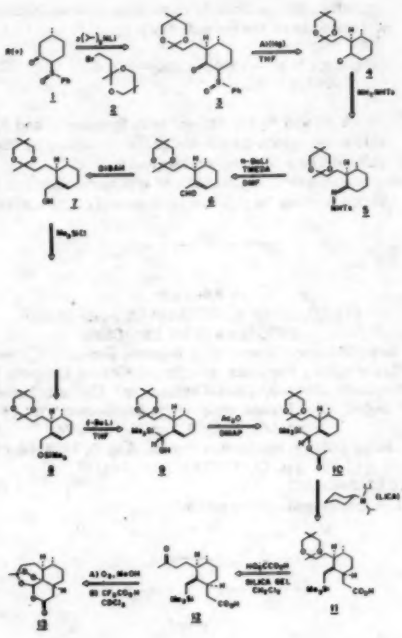
wherein R_1 is a one carbon atom long through two carbon atom long alkylene bridge containing from zero up to one lower alkyl substituent,

R_2 is a three carbon atom long through five carbon atom long alkylene bridge containing from zero up to two lower alkyl substituents,

R_3 is a one carbon atom through three carbon atom long alkylene bridge bridging the 1 and 4 positions in the formula having from zero up to two lower alkyl substituents on the carbon atom adjacent to the 4 position,

R_4 is selected from the group consisting of hydrogen, methyl and lower alkyl substituted methyl,

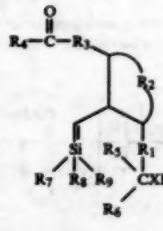
R_5 and R_6 are selected such that they together are a carbonyl oxygen or separately R_5 is selected from the group consisting of hydrogen, methyl and lower-alkyl substituted methyl and R_6 is selected from the group consisting of hydrogen, hydroxyl, alkyloxy, hydroxycarbonyloxy, alkylaminocarbonyl, alkylaminocarbonyloxy, and ureido,



and X is a heteroatom group selected from —O—, —S— and

wherein R_{10} is selected from the group consisting of hydrogen and lower alkyl,

which comprises subjecting to ozonolysis in a liquid reaction medium at a temperature of from about 15° C. to the freezing temperature of the liquid reaction medium a vinylsilane compound of the formula



wherein R_1, R_2, R_3, R_4, R_5, R_6, R_{10}, and X are as defined and R_7, R_8 and R_9 are independently selected from lower hydrocarbyls.

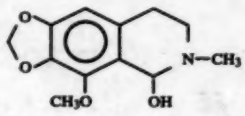
4,963,684

PROCESS FOR PREPARING COTARNINE

Yoshiharu Morita, Yokohama; Naoshi Imaki, Atsugi; Tadashi Shirasaka, Machida, and Tetsuro Shimpuku, Yokohama, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

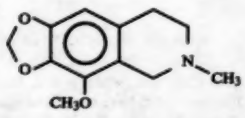
Continuation of Ser. No. 901,368, Aug. 28, 1986, abandoned. This application Feb. 7, 1989, Ser. No. 307,247
Claims priority, application Japan, Sep. 11, 1985, 60-201075
Int. Cl.[5] C07D 491/056
U.S. Cl. 546—90 11 Claims

1. A process for preparing cotarnine of the formula:

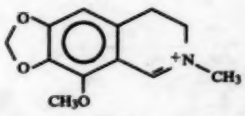


which comprises:

reacting from 0.1 to 10 moles of an oxidizing agent selected from the group consisting of a halogen, a hypohalogenouos acid and salts thereof, N-bromosuccinimide and N-chlorosuccinimide, which is a halogenating agent, with 1 mole of a tetrahydroisoquinoline compound of the formula:



in a solvent selected from the group consisting of alcohols, carboxylic acids, ethers, hydrocarbons and halogenated hydrocarbons, thereby oxidizing said tetrahydroisoquinoline compound to a dihydroisoquinolinium cation of the formula:



and

hydrolyzing said dihydroisoquinolinium cation by reacting 1 mole of said cation with from 1 to 100 moles of a base selected from the group consisting of the salt of an organic carboxylic acid, a metal alkoxide, a metal hydroxide and a carbonate salt at a temperature ranging from −20° to 100° C. in a solvent.

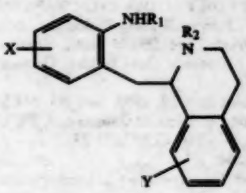
4,963,685

INTERMEDIATES FOR THE PREPARATION OF TETRAHYDROISOQUINO[2,1-C][1,3]BENZODIAZEPINES

Lawrence L. Martin, Lebanon, and Richard C. Allen, Flemington, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 344,799, Apr. 28, 1989, Pat. No. 4,908,361. This application Dec. 21, 1989, Ser. No. 454,490
Int. Cl.[5] C07D 217/18
U.S. Cl. 546—146 4 Claims

1. A compound of the formula



Where X and Y are independently hydrogen, halogen, loweralkyl, loweralkoxy or—CF_3, R_1 is hydrogen or

and R_2 is hydrogen and R_4CO, where R_4 is hydrogen or loweralkyl, with the proviso that R_1, R_2, X and Y cannot all be hydrogen, and the pharmaceutically aceptable acid addition salts thereof.

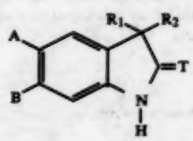
4,963,686

CERTAIN PYRIDINOYLAMINO-INDOLIN-2-ONE DERIVATIVES

Jens-Peter Hölck, Mannheim; Alfred Mertens, Schriesheim; Wolfgang Kampe, Heddesheim; Bernd Müller-Beckmann, Grünstadt; Gisbert Sponer, Laudenbach, and Klaus Streis, Hemsbach, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 12,098, Feb. 6, 1987, abandoned, which is a division of Ser. No. 731,500, May 7, 1985, Pat. No. 4,666,923. This application Jul. 5, 1988, Ser. No. 217,143
Claims priority, application Fed. Rep. of Germany, May 12, 1984, 3417643; Dec. 20, 1984, 3446417
Int. Cl.[5] C07D 401/12; A61K 31/44
U.S. Cl. 546—273 13 Claims

1. A compound of the formula



(XXX)

wherein

R_1 is hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl or C_3–C_7 cycloalkyl,

R_2 is hydrogen, C_1–C_6 alkyl or C_2–C_6 alkenyl,

A is hydrogen, amino, nitro or Py—X—CO—NH— and

B is hydrogen, amino, nitro or Py—X—CO—NH—, in which X is a valency bond and Py is 2-, 3-, or 4-pyridyl which optionally carries oxygen on the righ hetero atom and can be optionally substituted with at least one member selected from the group consisting of C_1–C_6 alkyl, C_1–C_6 alkoxy, hydroxyl, cyano, nitro or halogen, and

T is oxygen or sulphur; with the proviso that either A or B is Py—X—CO—NH— and A and B are not simultaneously Py—X—CO—NH.

4,963,687

PROCESS FOR PRODUCING CYANOPYRIDINES

Masao Saito, Tokyo; Kengo Tsukahara, Niigata; Koichiro Yamada, Niigata, and Hisasi Imai, Niigata, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Apr. 24, 1989, Ser. No. 341,874
Claims priority, application Japan, Apr. 28, 1988, 63-103766
Int. Cl.[5] C07D 213/57
U.S. Cl. 546—286 5 Claims

1. A process for producing a cyanopyridine comprising, reacting a corresponding methylpyridine, ammonia and an oxygen-containing gas in the presence of a composition selected from the group consisting of:

(a) a catalyst consisting essentially of a vanadium oxide, a chromium oxide, a boron oxide and a phosphorus oxide, wherein the atomic ratio of vanadium, chromium, boron and phosphorous in said catalyst is 1:0.5 to 2:0.2 to 1.2:0 to 0.3, and

(b) a catalyst consisting essentially of a vanadium oxide, a chromium oxide, a molybdenum oxide and a boron oxide, wherein the atomic ratio of vanadium, chromium, molybdenum and boron in said catalyst is 1:0.5 to 2:0.01 to 1.2:0.01 to 1.2.

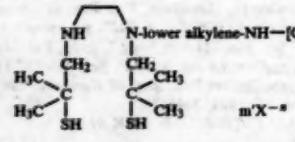
4,963,688

COMPOUNDS FOR SITE-ENHANCED DELIVERY OF RADIONUCLIDES AND USES THEREOF

Nicholas S. Bodor, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

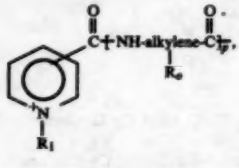
Continuation of Ser. No. 879,120, Mar. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 632,314, Jul. 19, 1984, abandoned. This application Aug. 21, 1987, Ser. No. 88,523
Int. Cl.[5] C07D 213/56, 401/00, 213/79, 213/56
U.S. Cl. 546—316 7 Claims

1. A salt having the structural formula

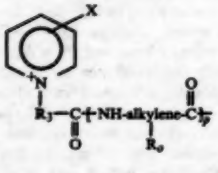


(Ic)

wherein X^- is the anion of a pharmaceutically acceptable organic or inorganic acid; n is the valence of the acid anion; m, is a number which when multiplied by n is equal to one; and $[QC^+]$ is a radical of the formula

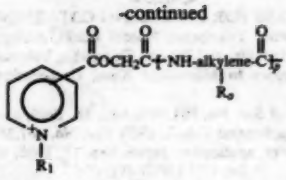


(a)



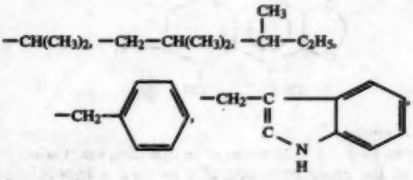
or

-continued



(c)

wherein the alkylene group can be straight or branched and can contain 1 to 3 carbon atoms; R_o is hydrogen, methyl,



p is 0, 1 or 2, provided that, when p is 2, then the alkylene groups can be the same or different and the R_o radicals can be the same or different; R_1 is C_1–C_7 alkyl, C_1–C_7 haloalkyl or C_7–C_{10} aralkyl; R_3 is C_1 to C_3 alkylene; X is —CONR'R" wherein R' and R", which can be the same or different, are each H or C_1–C_7 alkyl, or X is —CH=NOR'" wherein R'" is H or C_1–C_7 alkyl; and the carbonyl-containing groupings in formulas (a) and (c) and the X substituent in formula (b) can each be attached at the 2, 3 or 4 position of the pyridinium ring.

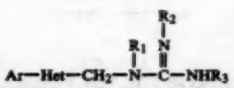
4,963,689

HETEROCYCLICGUANIDINES AS 5HT$_3$ ANTAGONISTS

Arthur A. Nagel; James P. Rizzi, and Terry J. Rosen, all of Groton, Conn., assignors to Pfizer Inc., New York, N.Y.

Filed May 19, 1989, Ser. No. 349,189
Int. Cl.[5] C07D 277/28, 417/04
U.S. Cl. 548—181 9 Claims

1. A compound of the formula



(b)

or a pharmaceutically acceptable acid addition salt thereof, wherein Ar is naphthyl, indol-3-yl, 2-methylindol-3-yl, 1-methylindol-3-yl, 1-benzylindol-3-yl phenyl, or mono- or di-substituted phenyl wherein said substituent is each methyl, methoxy, chloro, fluoro or bromo; Het is 4-thiazol-2-yl, 3-isoxazol-5-yl, 2-thien-5-yl or 2-fur-5-yl; R_1 is hydrogen or methyl; R_2 and R_3 when considered separately are each hydrogen, hydroxyethyl, alkyl having one to six carbon atoms, cycloalkyl having three to six carbon atoms or acetyl; and R_2 and R_3 when taken together are alkylene having two to three carbon atoms.

4,963,690

N-AMINOTRIAZOLE DERIVATIVES

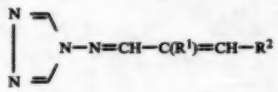
Rainer Seele, Fussgoenheim; Stefan Karbach, Neustadt-Hambach; Reiner Kober, Fussgoenheim; Matthias Zipplies, Hirschberg; Hubert Sauter, Mannheim, all of Fed. Rep. of Germany; Barbara A. Moore, Pittsboro, N.C.; Dale R. Carlson, Hillsborough, N.C.; Paul S. Zorner, Durham, N.C.; Karl-Otto Westphalen, Speyer, and Bruno Wuerzer, Otterstadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 6, 1989, Ser. No. 418,090

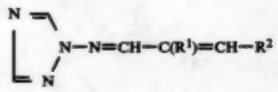
Int. Cl.[5] C07D *249/08*

U.S. Cl. 548—264.8 3 Claims

1. An N-aminotriazole derivative of the formulae Ia or Ib



Ia



Ib

where R^1 and R^2 are each selected from the group consisting of C_1–C_8-alkyl, C_3–C_8-cycloalkyl, C_5–C_8-cycloalkenyl, tetrahydropyranyl, norbornyl, phenyl, biphenyl, naphthyl and pyridyl, and the aromatic radicals may be substituted with one to five halogen atoms or one to three hydroxy, phenoxy, nitro, amino, cyano, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy or C_1–C_4-alkylthio radicals, and their salts which are environmentally compatible and tolerated by crops.

4,963,691

SPIRODILACTAM DERIVATIVES

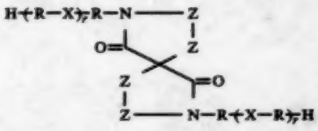
Pen-Chung Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 11, 1989, Ser. No. 392,312

Int. Cl.[5] C07D *487/10*; C08F *22/40*

U.S. Cl. 548—410 6 Claims

1. A spirodilactam of the formula



wherein Z independently is $>C(Z')_2$ in which Z' independently is hydrogen, lower alkyl, lower halo or phenyl, R independently is a phenylene group, X independently is a direct valence bond, alkylene of up to 8 carbon atoms inclusive, oxy, thio, sulfonyl, dioxyphenylene, 2,2-di(oxyphenyl)propane, di(oxyphenyl) sulfone or dioxydiphenylene, and r independently is 0 or 1.

4,963,692

BRAKE CONTROL VALVE

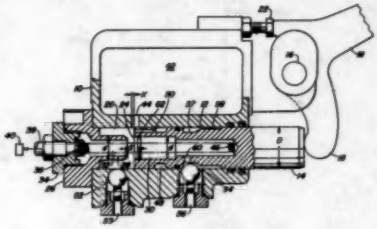
Sabah Halabiya, Rheinhausen, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Oct. 19, 1989, Ser. No. 424,783

Claims priority, application European Pat. Off., Nov. 5, 1988, 3837650

Int. Cl.[5] B60T 11/08; F15B 7/04

U.S. Cl. 60—578 11 Claims



1. A brake control valve having a housing having a bore therein, an end member closing one end of the bore, a piston member of diameter D axially movable in the bore, a wall of the bore, the end member and an end face of the piston member defining a pressure chamber, and a line for connecting the pressure chamber to a brake device, and an actuator for moving the piston, characterized by:

one of the piston and end members having a blind bore of diameter d less than diameter D projecting axially therein;

means for communicating the blind bore to the brake device;

and the other of the piston and end members having a projection projecting axially towards the blind bore, the projection and the blind bore being axially spaced apart during a rest position of the piston member so that fluid exposed to a larger working area of diameter D is forced from the pressure chamber to the brake device upon initial movement of the piston, further movement of the piston causing the blind bore to sealingly receive the projection so that fluid exposed only to a smaller working area of the piston is forced from the pressure chamber to the brake device.

4,963,693

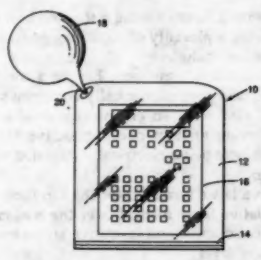
PURGE ENCLOSURE FOR ELECTRICAL EQUIPMENT IN HAZARDOUS LOCATION

David A. Kodl, Auburn, Ala., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 1, 1989, Ser. No. 402,095

Int. Cl.[5] H05K 5/00

U.S. Cl. 174—11 R 4 Claims



1. A protective, sealable enclosure capable of maintaining an atmosphere therein which is positive relative to the atmosphere outside the enclosure and separate therefrom, said enclosure being formed of a flexible material sufficiently transparent to enable a user to view a manually operable device, when sealed therein, and the functional features associated with such device, the balance between the positive atmosphere within the sealed enclosure and the flexible material forming the enclosure permitting manual operation of the device, while said enclosure retains said positive atmosphere therewithin, said enclosure including a balloon connected to the enclosure so as to have the same positive pressure as the positive pressure of the enclosure, said balloon being inflated to the same positive atmosphere as the atmosphere within the sealed enclosure and thereby being capable of indicating a change in the pressure retained by the enclosure.

4,963,694

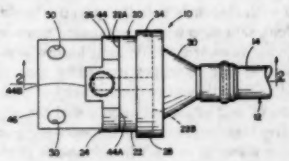
CONNECTOR ASSEMBLY FOR INTERNALLY-COOLED LITZ-WIRE CABLE

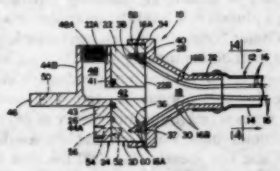
Christopher C. Alexion, North Huntingdon; Thomas D. Horbubay, Penn Hills Township, Allegheny County; Wesley Manrose, North Huntingdon, all of Pa.; Steven R. Walk, Winterport, Me., and Robert M. Slepian, Wilkinsburg, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 5, 1989, Ser. No. 361,205

Int. Cl.[5] H01B 7/34

U.S. Cl. 174—15.6 16 Claims





1. A connector assembly for transferring high-frequency current into or from an electrical cable having multiple conductor strands, said connector assembly comprising:

(a) a connector body;

(b) means on said body for receiving and making electrical connection with ends of the multiple conductor strands to be disposed in an annular splayed configuration of a diameter larger than the diameter of the cable to be connected; and

(c) means on said body for making an external electrical connection;

(d) said body having opposite axial ends and said receiving means being an annular groove formed in one end of said body for receiving the conductor strand ends to be received in the annular splayed configuration and a bonding material for electrically connecting the ends to the body at said groove.

4,963,695

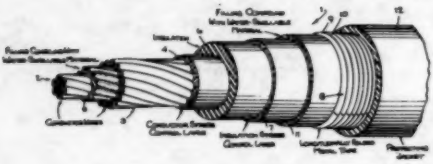
POWER CABLE WITH METALLIC SHIELDING TAPE AND WATER SWELLABLE POWDER

Fabrizio Marciano-Agostinelli, Columbia, S.C.; Marco Barbaro-Forleo, Short Hills, N.J.; Paul L. Cinquemani, Lexington, and Michael D. Buckweitz, Greenwood, both of S.C., assignors to Pirelli Cable Corporation, Union, N.J.

Continuation-in-part of Ser. No. 68,670, Jul. 1, 1987, abandoned, which is a division of Ser. No. 864,196, May 16, 1986, Pat. No. 4,703,132. This application Dec. 20, 1988, Ser. No. 287,486

Int. Cl.[5] H01B 7/23 R, 13/00

U.S. Cl. 174—23 C 34 Claims



1. In an electrical power cable comprising a stranded conductor formed by a plurality of wires stranded together and in conductive contact with adjacent wires, particles of water swellable material within any interstices in said conductor, a semi-conductive stress control layer around said conductor, a layer of insulation around said stress control layer, a semi-conductive insulation shield of substantially constant cross-sectional radius around said insulation and a longitudinally folded strip of metal with circumferentially spaced edges around said insulation shield, said strip being corrugated transversely to its length to provide outwardly extending humps and intermediate valleys and having its edges extending longitudinally of said cable and being adjacent to each other but with a space at the face of one of said edges between it and the adjacent portion of the strip, the improvement comprising particles of a water swellable material at least in said space at the adjacent edges of said strip.

21. A method of making an electrical power transmission cable having a plurality of layers of uninsulated wires thereby providing an outer layer of wires and an inner layer or layers of wires, said method comprising:

bringing together said wires into conductive contact while applying flowable polymeric compound around at least the said wires forming the inner layer or layers;

putting particles of a water swellable material having a particles size not greater than 200 microns into contact with said polymeric compound which is applied around said wires forming said inner layer or layers;

extruding a first layer of semi-conductive material around said wires;

extruding a layer of insulation around said layer of semi-conductive material;

extruding a second layer of semi-conductive material of substantially constant cross-sectional radius around said layer of insulation;

longitudinally folding a metallic strip around said second layer so as to provide overlapping edge portions extending longitudinally of the cable said edges being adjacent to each other but with a space at the face of one of said edges between it and the adjacent portion of the strip; and

applying particles of a water swellable material adjacent the edge portions of said strip prior to completion of the folding of said strip so as to provide said particles at least in said space.

4,963,696

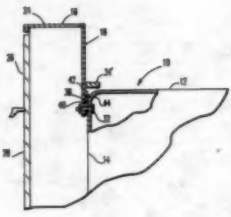
TAMPER RESISTANT PADMOUNTED TRANSFORMER

Timothy C. Owen, Jefferson City; Virgil L. Borgmeyer, Metz, and Herbert S. Adkins, Vienna, all of Mo., assignors to ABB Power T&D Company, Inc., Blue Bell, Pa.

Filed Oct. 11, 1989, Ser. No. 419,917

Int. Cl.[5] H01F 27/02

U.S. Cl. 174—50 26 Claims



25. A tamper-resistant transformer of the type having at least two exterior walls that mutually abut in parallel relationship at one portion thereof and then diverge apart at another portion thereof, wherein an interface is defined between said walls at the point of divergence, comprising:

a flange extending from one of said walls and overlying said interface to form a tamper-resistant structure over said interface.

4,963,697

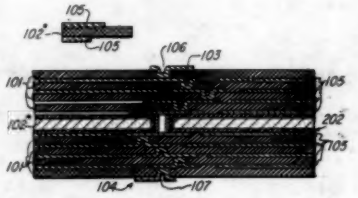
ADVANCED POLYMERS ON METAL PRINTED WIRING BOARD

Robert K. Peterson, Garland; Larry J. Mowatt, Allen, and Aaron D. Poteet, Austin, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 12, 1988, Ser. No. 155,461

Int. Cl.[5] H05K 1/00

U.S. Cl. 174—252 4 Claims



1. A printed wiring board having a top and bottom surface, said surfaces having a plurality of mounting pads, said printed wiring board further including:

a central, substantially rigid core having a top face and a bottom face, said core substantially comprising a composite material clad with an electrically conductive metal, said core having at least one conductive through-hole, said through-hole being electrically insulated with respect to said core;

a first insulative layer formed over the top face;

a second insulative layer formed over the bottom face;

a plurality of conductive and insulative layers overlying the first insulative layer;

a plurality of alternating conductive and insulative layers overlying the second insulative layer, said through-hole being electrically coupled to a first conductive region overlying said top face and to a second electrically conductive region overlying said bottom face,

selected portions of said patterned conductive layers being electrically coupled to said first and second conductive regions by conductive vias extending through said first and second insulating layers; and

selected ones of said mounting pads on said top and bottom surfaces being electrically coupled to said selected portions of said patterned conductive layers whereby an electrical interconnect extends through said rigid core from said top surface to said bottom surface.

4,963,698

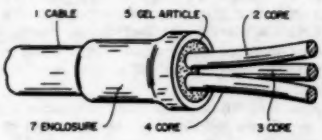
CABLE SEALING

Rong J. Chang, Fremont; John A. Midgley, San Carlos, and Lester T. Toy, Fremont, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 188,124, Apr. 25, 1988, abandoned, which is a continuation of Ser. No. 65,649, Jun. 22, 1987, abandoned, which is a continuation of Ser. No. 859,160, May 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 730,409, May 2, 1985, abandoned. This application Sep. 15, 1989, Ser. No. 408,479

Int. Cl.[5] H02G *15/08, 1/14*

U.S. Cl. 174—77 R **93 Claims**



1. A method of sealing an area between two or more cables and between the cables and an enclosure at a location where the cables exit from the enclosure, which method comprises

(a) providing a shaped article of polymeric gel, said polymeric gel having

(i) a cone penetration value of about 30 to about 400 (10^{-1} mm),

(ii) an elongation of from about 25% to about 850%;

(b) positioning the shaped article such that it surrounds each of two or more cables; and

(c) positioning an enclosure such that it surrounds the shaped article whereby the area between said two or more cables and said enclosure is sealed at a location where the cables exit from the enclosure.

58. An article comprising

(a) one or more cable ends with a portion of the cable end exposed;

(b) one or more shaped articles of a polymeric gel corresponding to the number of cable ends to be sealed, the polymeric gel having

(i) a cone penetration value of about 30 to about 400 (10^{-1} mm)

(ii) an elongation from about 25% to about 850%;

(c) a said shaped article positioned at each cable end to be sealed;

(d) an enclosure that surrounds the shaped article.

4,963,699

APPARATUS FOR CONNECTING SETS OF ELECTRIC WIRES TO LEAD WIRES

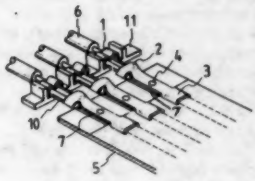
Kenichi Urushibata; Keiichi Kojima; Kiyoto Sugawara, and Haruo Saen, all of Tochigi, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

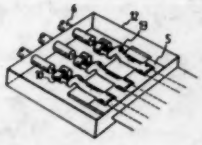
Filed Apr. 7, 1989, Ser. No. 334,369

Claims priority, application Japan, Apr. 12, 1988, 63-89782; May 24, 1988, 63-126450

Int. Cl.[5] H01R *11/01*

U.S. Cl. 174—88 R **20 Claims**





1. An apparatus for connecting a plurality of lead wires to a corresponding plurality of flat wires comprising:

a plurality of connector terminals, each connector terminal for connecting a first wire of said plurality of lead wires to a corresponding second wire of said plurality of flat wires, each connector terminal comprising:

a base portion having first and second ends,

a first crimpable portion for securing said first wire to said first end of said base portion,

a clasping portion for connecting said second wire to said second end of said base portion, said clasping portion comprising a first spring portion having a first end and a second end, said first end of said first spring portion being connected to a middle portion of said base portion, and a second crimpable portion disposed at said second end of said first spring portion for securing said first spring portion to said second end of said base portion, said second wire adapted to be disposed between said first spring portion and said second end of said base portion, and

a projecting portion projecting from said connector terminal for contact with said second wire; and

means for separating said connector terminals, said separating means for preventing a short circuit between the connector terminals.

4,963,700

CLOSURE ARRANGEMENTS FOR ELECTRICAL SPLICES

Arnold T. Olsen, Austin, and John S. Young, Leander, both of Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 26, 1989, Ser. No. 341,760

Int. Cl.[5] H01R *4/70*; H02G *15/113*

U.S. Cl. 174—138 F **3 Claims**

1. A sealant/closure combination for use in providing an environmental seal about a wire junction; said combination comprising:

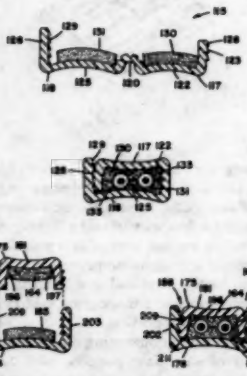
(a) a closable shell defining, when closed, an internal wire junction receiving chamber having first and second, opposite, open ends; said shell including first and second shell sections joined to one another along a hinge;

(i) said first shell section comprising an elongate trough member having first and second opposite sidewalls with a central, internal, convex longitudinal surface extending therebetween and integral therewith; said first shell section central convex longitudinal surface having a radius of curvature of between about 4.75 and 5.25 cm; said first shell section having internal and external wall portions;

(ii) said second shell section comprising an elongate trough member having first and second opposite sidewalls with a central, internal, convex, longitudinal surface extending therebetween and integral therewith; said second shell section central, convex, longitudinal surface having a radius of curvature of between about 4.75 and 5.25 cm; said second shell section having internal and external wall portions;

(iii) said first shell section first sidewall and said second shell section first sidewall being joined to one another along said hinge;

(b) an interference fit locking arrangement including first and second interlocking members; said first interlocking member being oriented on said first shell section exter-



nal wall portion and said second interlocking member being oriented on said second shell section internal wall portion;

(i) said first and second interlocking members respectively including a first elongate longitudinal ratchet member and a second elongate longitudinal ratchet member; said first and second elongate longitudinal ratchet members being selectively engageable with one another to retain said shell in a closed orientation;

(ii) said first elongate ratchet member including a plurality of longitudinal ridges and said second ratchet member including a plurality of longitudinal ridges; said first ratchet member longitudinal ridges being selectively engageable with said second ratchet member longitudinal ridges;

(c) a field of sealant material positioned on said first shell section central internal longitudinal surface and oriented in complete extension between said first shell section first and second, opposite, sidewalls; and

(d) a field of sealant material positioned on said second shell section central internal longitudinal surface and oriented in extension from said second shell section first sidewall partially across said second shell section central longitudinal surface to terminate leaving a gap adjacent to said second shell section second sidewall; said gap being sized for partial receipt of said first shell section second sidewall therein, during closure.

3. A sealant/closure combination for use in providing an environmental seal about a wire junction; said combination comprising:

(a) a closable shell defining, when closed, an internal wire junction receiving chamber having first and second, opposite, open ends; said shell comprising first and second, separable, shell sections;

(i) said first shell section comprising an elongate trough member having first and second opposite sidewalls with a central, internal, convex longitudinal surface extending therebetween and integral therewith; said first shell section central convex longitudinal surface having a radius of curvature of between about 4.75 and 5.25 cm; said first shell section having internal and external wall portions;

(ii) said second shell section comprising an elongate trough member having first and second opposite sidewalls with a central, internal, convex, longitudinal surface extending therebetween and internal therewith; said second shell section central, convex, longitudinal surface having a radius of curvature of between about 4.75 and 5.25 cm; said second shell section having internal and external wall portions;

(b) a first interference fit locking arrangement including first and second interlocking members; said first interlocking member being oriented on an external wall portion of said first shell section first sidewall and said second interlocking member being oriented on an internal wall portion of said second shell section first sidewall;

(i) said first and second interlocking members respectively including a first elongate longitudinal ratchet member and a second elongate longitudinal ratchet member; said first and second elongate longitudinal ratchet members being selectively engageable with one another to retain said shell in a closed orientation;

(ii) said first elongate ratchet member including a plurality of longitudinal ridges and said second ratchet member including a plurality of longitudinal ridges; said first ratchet member longitudinal ridges being selectively engageable with said second ratchet member longitudinal ridges;

(c) a second interference fit locking arrangement including third and fourth interlocking members; said third interlocking member being oriented on an external wall portion of said first shell section second sidewall and said fourth interlocking member being oriented on an internal wall portion of said second shell section second sidewall;

(i) said third and fourth interlocking members respectively including a third elongate longitudinal ratchet member and a fourth elongate longitudinal ratchet member; said third and fourth elongate longitudinal ratchet members being selectively engageable with one another to retain said shell in a closed orientation;

(ii) said third elongate ratchet member including a plurality of longitudinal ridges and said fourth ratchet member including a plurality of longitudinal ridges; said third ratchet member longitudinal ridges being selectively engageable with said fourth ratchet member longitudinal ridges;

(d) a field of sealant material positioned on said first shell section central internal longitudinal surface and oriented in compete extension between said first shell section first and second, opposite, sidewalls; and

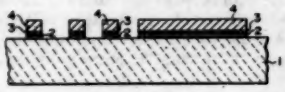
(e) a field of sealant material positioned on said second shell section central internal longitudinal surface and further oriented to leave: a first gap between a first edge of the field of sealant and said second shell section first sidewall, for receipt of a portion of said first shell section first sidewall therein, during closure; and, a second gap between a second edge of the field of sealant and said second shell section second sidewall, for receipt of a portion of said first shell section second sidewall therein, during closure.

4,963,701

CIRCUIT BOARD

Takaaki Yasumoto, Kawasaki, and Nobuo Iwase, Kamakura, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 24, 1989, Ser. No. 300,944
Claims priority, application Japan, Jan. 25, 1988, 63-12687; Aug. 23, 1988, 63-208602; Nov. 2, 1988, 63-277931
Int. Cl.[5] H05K 1/00
U.S. Cl. 174—256 12 Claims



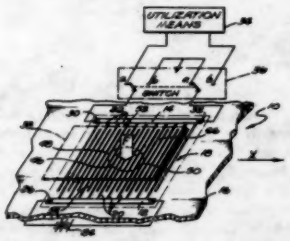
1. An aluminum nitride thin film circuit board comprising an aluminum nitride substrate and a conductive thin film pattern formed on said substrate, wherein said conductive thin film pattern has a multi-layer structure selected from the group consisting of Ti/Ni/Au, Ti/Pd/Au, Ti/Pt/Au, Ni/Au, Cr/Au, and Cr/Cu/Au, and a boundary layer of Al-N-M-O (M is Ti, Ni, or Cr) is formed between said substrate and said conductive thin film pattern.

4,963,702

DIGITIZER PAD FEATURING SPACIAL DEFINITION OF A PRESSURE CONTACT AREA

Stuart I. Yaniger, Ventura, and James P. Rivers, Santa Barbara, both of Calif., assignors to Interlink Electronics, Inc., Carpenteria, Calif.

Filed Feb. 9, 1989, Ser. No. 308,706
Int. Cl.[5] G08C 21/00
U.S. Cl. 178—18 20 Claims



1. A digitizer pad apparatus comprising at least one digitizer ply, each digitizer ply comprising:

a first resistor strip having a first end and a second end, the first resistor strip having a first resistance gradient along its length between the first end and the second end;

a plurality of first conductor traces interconnected to the first resistor strip along its length and extending from the first resistor strip, the first conductor traces arranged in spaced apart relationship to each other;

a second resistor strip having a third end and a fourth end, the second resistor strip having a second resistance gradient along its length between the third end and the fourth end;

a plurality of second conductor traces interconnected to the second resistor strip along its length and extending from the second resistor strip, the second conductor traces arranged in spaced apart relationship to each other, the first and second conductor traces arranged in interleaved, non-contacting relationship to each other to define a sensor pad region and a dimensional direction in the sensor pad region;

a shunt ply positioned adjacent to the sensor pad region but in normally non-conducting relationship thereto for having selected areas thereof pressed into contact with the first and second conductor traces to enable conduction between adjacent ones of the first and second conductor traces via the shunt ply in the selected contact area, the selected contact area defined by a first edge and a second edge opposite the first edge along the dimensional direction;

a voltage source coupled across the first and second ends of the first resistor strip;

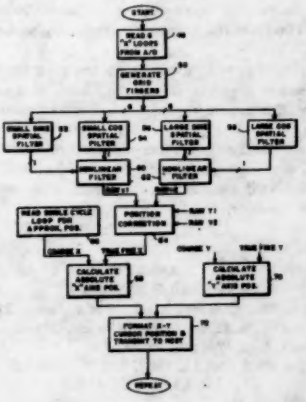
means for intermittently coupling one of the third end to a utilization means and the fourth end to the utilization means, the voltage at the utilization means when the third end is coupled thereto being a measure of the location on the sensor pad region of the first edge of the selected contact area along the dimensional direction, the voltage at the utilization means when the fourth end is coupled thereto being a measure of the location on the sensor pad region of the second edge of the selected contact area along the dimensional direction.

4,963,703

COORDINATE DETERMINING DEVICE USING SPATIAL FILTERS

Mark J. Phillips, Wayland; Patrick T. Philbin, Waltham, both of Mass., and Barry A. Blesser, Raymond, N.H., assignors to Numonics Corporation, Montgomeryville, Pa.

Filed Jul. 18, 1989, Ser. No. 381,765
Int. Cl.[5] G08C 21/00
U.S. Cl. 178—19 9 Claims



9. A digitizing tablet for use with a position indicating implement, said tablet comprising:

a two-dimensional work surface;

a series of conductive grids for producing a plurality of spatially dependent data signals;

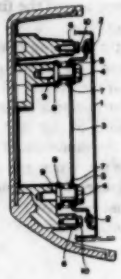
processing means, including at least two sets of linear spatial filters for converting said data signals into at least two raw position signals and a correction scheme for using the difference between said raw position signals to arrive at an actual position signal.

4,963,704

HORN SWITCH OF STEERING WHEEL

Koji Buma, and Fuminori Komiya, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Oct. 30, 1989, Ser. No. 428,889
Claims priority, application Japan, Nov. 1, 1988, 63-143668
Int. Cl.[5] H01H 9/00
U.S. Cl. 200—61.55 5 Claims



1. A horn switch of a steering wheel comprising:

a horn pad mounting member having a horn circuit make and break moving contact capable of contacting with a horn circuit make and break fixed contact arranged at a steering wheel body, a horn pad being mounted to said mounting member;

a screw member screwed into the body and permitting said mounting member to be movably mounted on the body so that the moving contact is capable of contacting with and separating from the fixed contact;

a coil spring having a first end and a second end, said first end being disposed adjacent to said mounting member and said second end being disposed adjacent to said steering wheel body, said coil spring surrounding said screw member;

an annular member including an aperture through which said screw member is fed, said annular member being disposed adjacent to said second end of said coil spring; and

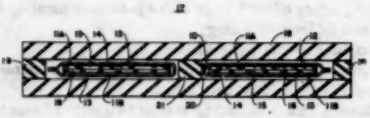
an annular engaging member mounted on said screw member and engaging said aperture of said annular member to prevent said annular member from dropping from said screw member.

4,963,705

TREADLE ASSEMBLY

John Broderick, Andover, Mass.; Peter Jones, Londonderry, N.H., and Vincent Squitieri, Billerica, Mass., assignors to Chomerics, Inc., Woburn, Mass.

Filed Apr. 11, 1989, Ser. No. 336,365
Int. Cl.[5] H01H 21/26
U.S. Cl. 200—86 R 23 Claims



1. A flexible circuit treadle apparatus comprising:

(a) superimposed top and bottom sheets of flexible material joined at their edges to define a substantially flat envelope;

(b) at least one movable electrically conductive contact means disposed immediately adjacent said top sheet;

(c) a flexible spacer material disposed immediately adjacent said movable contact means and having at least one open area therein;

(d) a conductive elastomeric sheet disposed immediately adjacent said flexible spacer material; and

(e) at least one fixed electrically conductive contact means immediately adjacent said conductive elastomeric sheet;

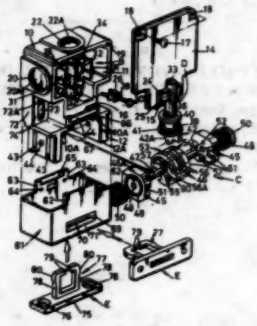
whereby as pressure is applied to the treadle apparatus said elastomeric sheet is deflected such that it establishes a conductive path between said fixed and movable contact means; wherein said elastomeric sheet is located between the movable and fixed contact means and wherein each of the elements "b" through "e" above is disposed within the envelope of "a".

4,963,706

SAFETY SWITCH ASSEMBLIES

Mehdi Mohtasham, Manchester, United Kingdom, assignor to EJA Engineering Company Limited, Wigan, England

Filed Jan. 12, 1989, Ser. No. 296,501
Int. Cl.[5] H01H 21/84, 13/52
U.S. Cl. 200—334 21 Claims



1. A safety switch assembly comprising (A) a safety switch for securement to an enclosure having an openable closure, and (B) an actuator for operating the safety switch for securement to the closure; (C) the safety switch comprising a housing having laterally spaced wall means, an electrical contact arrangement contained within the housing, a cam arrangement also contained within the housing for operating the electrical contact arrangement and spaced from the electrical contact arrangement, radial pocket means formed in the cam arrangement and extending inwardly of the periphery of the cam arrangement, and axially-movable rod means connecting the electrical contact arrangement and the cam arrangement to operate the electrical contact arrangement in accordance with movements of the cam arrangement, the housing defining entry means adjacent the cam arrangement for insertion of the actuator into the housing to engage the radial pocket means to operate the cam arrangement, and the cam arrangement comprising shaft means bridging the wall means of the housing, actuating cam means rotatably supported on the shaft means, connecting means operatively securing the actuating cam means to the axially-movable rod means, the connecting means including cam follower pin means connected to the axially-movable rod means and cam groove means defined by the actuating cam means and within which the cam follower pin means is engaged, locking cam means also supported on the shaft means for movement along the shaft means, and resilient means between the locking cam means and housing wall means to urge the locking cam means towards the actuating cam means and into engagement with the cam follower pin means

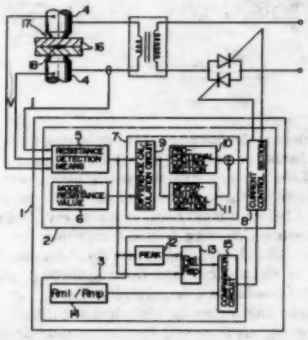
whereby the pin means serves releasably to lock the actuating cam means against rotation; and (D) the actuator comprising laterally-spaced limb means (i) insertible between the actuating cam means and the locking cam means to move the locking cam means along the shaft means away from the actuating cam means, and (ii) engagable with the actuating cam means to rotate the actuating cam means axially to move the rod means to operate the electrical contact arrangement.

4,963,707

RESISTANCE WELDING CONTROL SYSTEM

Keizou Zyokou, Okazaki; Shinzo Ito, Aichi, and Tsuyoshi Sugiyama, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 5, 1989, Ser. No. 375,778
Claims priority, application Japan, Jul. 6, 1988, 63-168545
Int. Cl.[5] B23K *11/24*
U.S. Cl. 219—110 12 Claims



1. A resistance welding control system comprising:
resistance detection means for detecting an interelectrode resistance by measuring a welding current and a voltage applied between electrodes;
compensation means for comparing a detected resistance value detected by said resistance detection means with a predetermined model resistance value and determining an amount of compensation of the welding current in accordance with a difference between the detected resistance value and the model resistance value; and
current control means for controlling an amount of said welding current on the basis of said amount of compensation determined by the compensation means, wherein said compensation means operates such that a first rate at which the welding current is reduced when the detection resistance value is higher than the model resistance value is higher than a second rate at which the welding current is increased when the detection resistance value is lower than the model resistance value.

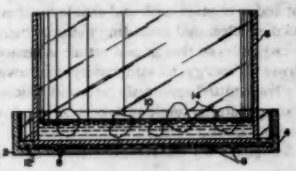
4,963,708

MICROWAVE COOKING APPARATUS

Joyce M. Kearns, New City, N.Y., and Richard Scarpellino, Ramsey, N.J., assignors to Kraft General Foods, Inc., Glenview, Ill.

Continuation of Ser. No. 166,062, Mar. 9, 1988, Pat. No. 4,795,659. This application Dec. 29, 1988, Ser. No. 291,812
The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.
Int. Cl.[5] H05B *6/00*
U.S. Cl. 219—10.55 E 5 Claims

1. A cooking utensil for cooking or reheating comestibles with microwave energy comprising:
an inner vessel;
an outer vessel;
means for maintaining a space between the outer surface of the bottom of the inner vessel and the inner surface of the outer vessel; and
a quantity of a microwave susceptible liquid placed in said outer vessel wherein said inner vessel is in conductive heat



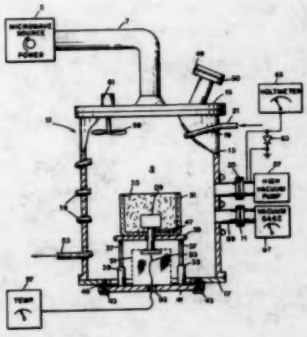
transfer contact with the microwave susceptible liquid contained within the outer vessel, said microwave susceptible liquid is an organic liquid which possesses a high dielectric loss factor as well as a boiling point greater than 150° C.

4,963,709

METHOD AND DEVICE FOR MICROWAVE SINTERING LARGE CERAMIC ARTICLES

Harold D. Kimrey, Jr., Knoxville, Tenn., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 77,580, Jul. 24, 1987, abandoned. This application Sep. 28, 1988, Ser. No. 251,070
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 M 11 Claims



1. A high power microwave sintering system for sintering ceramic articles comprising:
an adjustable power microwave source for generating microwaves at an output thereof at a frequency of at least 28 gigahertz;
an untuned microwave cavity formed of an electrically conductive housing having at least one inside dimension which is at least 100 times greater than the free space wavelength of said microwaves produced by said microwave source;
an overmoded waveguide means connected between the output of said source and said housing for transmitting microwave energy between said source and said housing and feeding microwave energy into said cavity in a plurality of available propagating modes within said cavity;
a microwave mode stirring means disposed within said cavity and formed to couple with available standing wave propagating mode patterns within said cavity so that said stirring means works in conjunction with said overmoded

waveguide means feed to provide a substantially uniform microwave energy field throughout said cavity;

a high temperature support means removably disposed within said cavity for supporting an article to be sintered in a central location within said cavity;

an insulating means including an insulating material disposed about and in contact with said article for thermally insulating said articles, said insulating material being transparent to microwaves so that as said article is heated by applying microwave energy to said cavity microwave energy is freely transmitted uniformly into said article through said insulating material while surface heat loss from said article is minimized; and

means for measuring the temperature of said article.

4,963,710

PROCESS AND DEVICE FOR MECHANICAL GRINDING OR SHARPENING OF WORKPIECES BY USE OF ELECTRICALLY CONDUCTIVE GRINDING OR SHARPENING TOOLS

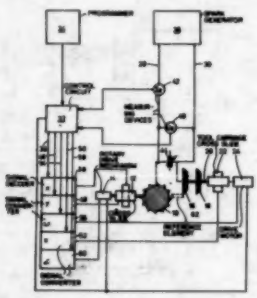
Horst Lach, Dammstr. 5, D-6450 Hanau, Fed. Rep. of Germany

Filed May 25, 1988, Ser. No. 198,808

Claims priority, application Fed. Rep. of Germany, May 25, 1987, 3717568

Int. Cl.[5] B23H *5/04*

U.S. Cl. 219—69.2 **7 Claims**



1. In a process for the mechanical grinding of workpieces by means of electrically conductive grinding tools, wherein there first occurs contact between the grinding tool and one of (a) the workpiece or (b) a reference element and then subsequently at this contact position, certain operational movements are determined and executed, and wherein a non-conductive liquid is fed between the grinding tool and the workpiece to insulate the grinding tool from the workpiece, the improvement wherein during said contact, an electric spark voltage is created between the grinding tool and the workpiece or reference element in contact therewith and the distance to the contact position is determined based on a measured value of the corresponding arc discharge current produced, and thereafter the spark voltage is switched off, or is set at a selected value for the grinding process, and removal of material is effected essentially mechanically, said measured value of said arc discharge current being used as a measurement of said distance in connection with effecting the mechanical removal of material and only in that connection.

4,963,711

ELECTRIC DISCHARGE POSITION DETECTING DEVICE OF A WIRE ELECTRIC DISCHARGE MACHINE

Haruki Obara, Toyama, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

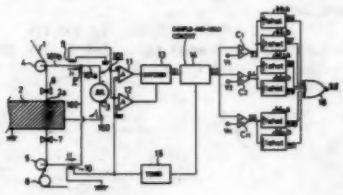
PCT No. PCT/JP88/01108, § 371 Date May 5, 1989, § 102(e) Date May 5, 1989, PCT Pub. No. WO89/04232, PCT Pub. Date May 18, 1989

PCT Filed Oct. 29, 1988, Ser. No. 362,383

Claims priority, application Japan, Oct. 31, 1987, 62-274659

Int. Cl.[5] B23H *7/04*

U.S. Cl. 219—69.12 **6 Claims**



1. An electric discharge position detecting device for a wire electric discharge machine in which an electric current is supplied form an electric discharge machining power source to a wire electrode through first and second conductors located above and below a workpiece, respectively, said electric discharge position detecting device comprising:

first and second detecting means for detecting the differentials of electric currents flowing through said first and second conductors, respectively; and

third detecting means for detecting the difference between output signals from said first and second detecting means to generate an output signal indicative of an electric discharge position, said third detecting means including:

a divider, operatively connected to said first and second detecting means, for dividing the difference between the output signals of said first and second detecting means by the differential of a total discharge current; and

a circuit, operatively connected to said divider, for sampling and holding an output of said divider at the start of electric discharge; and

fourth detecting means for detecting a change in the output signal from said third detecting means, said fourth detecting means including:

a plurality of comparators, each of said plurality of comparators connected to receive a different reference voltage, for comparing the output from said third detecting means to each respective reference voltage and outputting respective output signals; and

a plurality of timers, operatively connected to said plurality of comparators, triggered in response to at least one of the leading and trailing edges of the respective output signals from corresponding ones of said plurality of comparators, thereby producing outputs for a predetermined period of time.

4,963,712

SPOT WELDER

Hideyuki Etoh, Kobe; Kozo Shida, Miki; Toshiyuki Tange, Kobe, and Yoshio Shiotani, Kohesi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Aug. 18, 1989, Ser. No. 395,774

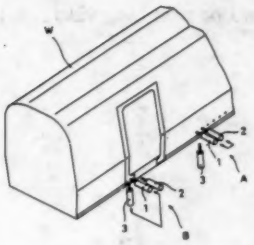
Claims priority, application Japan, Sep. 20, 1988, 63-123120[U]

Int. Cl.[5] B23K *11/10*

U.S. Cl. 219—86.9 **6 Claims**

1. A spot welder comprising a truck which is movable relative to a workpiece, first, second and third electrodes sup-

ported on said truck, said first and second electrodes being adapted to pair with each other for series welding, and one of said first and second electrodes being adapted to pair with said third electrode for indirect welding, means on said truck and



connected to said first, second and third electrodes for moving only a selected two of said electrodes against said workpiece at one time, and a power source connected to said first, second and third electrodes for powering only said selected two electrodes at a time.

4,963,713

COOLING OF A PLASMA ELECTRODE SYSTEM FOR AN ETCHING APPARATUS

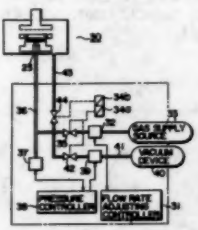
Takao Horiuchi, Tokyo; Izumi Arai, Yokohama, and Yoshifumi Tahara, Yamato, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed Jan. 19, 1989, Ser. No. 298,892

Claims priority, application Japan, Jan. 20, 1988, 63-10358; Feb. 15, 1988, 63-32099

Int. Cl.[5] B23K *9/00*

U.S. Cl. 219—121.43 4 Claims



1. An etching apparatus wherein electrodes are arranged in a vacuum container, a process gas in the vacuum container is changed to plasma by electric current applied to the electrodes, and a substrate mounted on the electrode is etched by the plasma of the process gas, said apparatus comprising:

a means for cooling the electrodes, a means for detecting if the cooling of the electrodes is below a desirable limit, and

a means for stopping the drive of the plasma generator, in response to a detection signal supplied from the detector means.

4,963,714

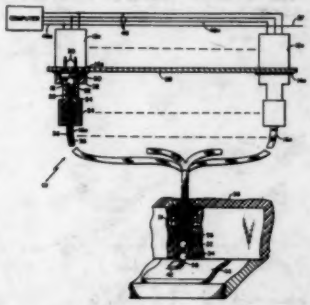
DIODE LASER SOLDERING SYSTEM

Joseph R. Adamski, Sudbury; Christopher Ferguson, Framingham; William E. Prifti, Milton, and William E. Nothe, Billerica, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 24, 1988, Ser. No. 261,064

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.63 15 Claims



1. An apparatus for directing laser light to provide laser soldering on an electronic circuit, said apparatus comprising:

means, comprising a plurality of laser diodes for generating a plurality of laser light beams; and

means optically coupled to said generating means for combining said laser light beam to form a single laser beam and for directing said single laser beam onto solder on said electronic circuit to reflow said solder and provide a solder connection.

4,963,715

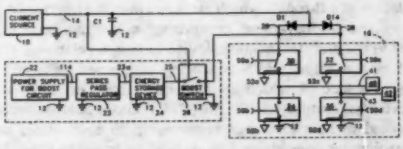
VARIABLE POLARITY POWER SUPPLY FOR WELDING

Wayne H. Tuttle, Torrance, Calif., assignor to Venable Industries, Inc., Torrance, Calif.

Filed Mar. 27, 1989, Ser. No. 328,949

Int. Cl.[5] B23K *9/073*

U.S. Cl. 219—130.4 27 Claims



1. A variable polarity power supply for welding, said power supply having a first output applied to a workpiece, and having a second output applied to a torch, said power supply having a current source for providing current in the forward direction and in the reverse direction said power supply comprising:

a control circuit for controlling the polarity of the first and the second outputs of the power supply;

a plurality of drivers connected to the control circuit;

a switching circuit for switching polarity of the power supply so that the polarity of the first output is switched with the polarity of the second output, said polarity switching circuit being responsive to the drivers;

a boost circuit for significantly increasing the open circuit voltage and the power applied between said workpiece and said torch by the power supply in response to an increase in the voltage on said current source output.

4,963,716

VEHICULAR AIR HEATER USING PTC HEATER TABLETS ASSOCIATED WITH FUNNEL HEAT EXCHANGES

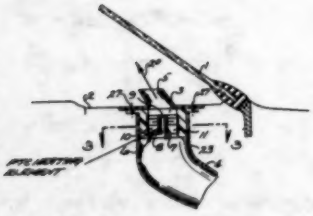
Fredrik M. N. Van Den Elst, Almelo, and Hendrikus Velten, Enter, both of Netherlands, assignors to Texas Instruments Incorporated, Dallas, Tex.

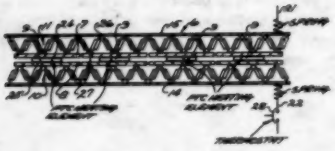
Filed Apr. 28, 1988, Ser. No. 187,185

Claims priority, application Netherlands, May 1, 1987, 8701036

Int. Cl.[5] H05B *1/02, 3/14;* F24H *3/04*

U.S. Cl. 219—202 7 Claims





1. In a land, sea or air vehicle provided with a cabin having a window, under which a panel is provided with an elongated ventilation slot through which air flows into the interior of the vehicle, the improvement comprising a heating device installed in the slot, the heating device having a relatively great length and a slight width and being composed of a pair of plates to a face of which are fastened tablets of material of positive temperature coefficient (PTC), and a heat exchanger connected in heat exchange relationship to each plate, each heat exchanger comprising fins upstanding from the other face of each plate to define air flow passages in a selected direction therebetween and having baffle means extending into the passages to introduce turbulence in air flowing through the passages, a sandwich being formed by the two plates with the PTC tablets fastened between the plates, the PTC tablets being disposed at spaced locations along the plates to define air flow passages therebetween so that air flowing in said selected direction is permitted to flow through the heat exchanger passages and between the plates around the PTC tablets, means for supplying electric energy to the tablets for producing heat, and means for mounting the heating device in the ventilation slot to direct air flowing through the slot to pass in said selected direction through the heat exchanger passages and between the plates around the PTC tablets in heat exchange relationship with the heat exchangers, plates and tablets for rapidly withdrawing said heat produced from the tablets.

4,963,717

GLOW PLUG FOR INTERNAL COMBUSTION ENGINE

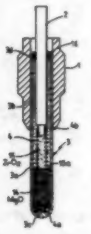
Serge Woelfle, Brussels, Belgium, assignor to Champion Spark Plug Europe S.A., Diegem, Belgium

Filed Apr. 4, 1989, Ser. No. 333,529

Claims priority, application United Kingdom, Apr. 6, 1988, 8807983

Int. Cl.[5] H05B *3/00;* F02P *19/02;* F23Q *7/00;* H01C *1/03*

U.S. Cl. 219—270 11 Claims



1. A glow plug for an internal combustion engine comprising an outer electrically conductive shell provided with an axially extending bore, an elongated electrically conductive tubular sheath having a first open end portion located inside said bore in electrical contact with said shell and a second portion closed at a free end projecting from said shell bore, an electrode extending into said pen sheath end and electrically insulated from said shell and said sheath, and further comprising at least one electrical resistance located in said tubular sheath and having a first end electrically connected to said electrode and a second end electrically connected to the free closed end of said tubular sheath, characterized in that the portion of said tubular sheath which is nearest to said free closed end is filled with a first electrically insulating thermally conductive powder and that the portion of said tubular sheath which is nearest to said electrode is filled with a second electrically insulating powder, said second powder having a substantially lower thermal conductivity than said first powder.

4,963,718

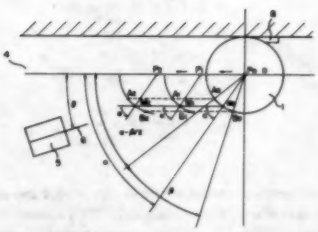
METHOD OF READING A BAR CODE ON A MOVING CYLINDRICAL BODY

Tatsuji Hoshizaki, Odawara, and Norio Sakamoto, Sagamihara, both of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 287,373

Int. Cl.[5] G06K *7/10, 9/18*

U.S. Cl. 235—462 5 Claims



1. A method of reading a bar code printed on a cylindrical surface of an article, wherein the printed area of the bar code has a given arc length around the cylindrical surface, the method comprising the steps of:

transporting the article in a predetermined direction, wherein the article is positioned so that a line normal to

and extending from the cylindrical surface at a point at the middle of the arc length forms an acute angle to the predetermined direction; and

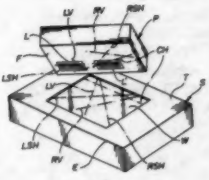
irradiating the bar code with a light beam at a predetermined angle to the predetermined direction, wherein the predetermined angle is smaller than the acute angle of the normal line.

4,963,719

BAR CODE SCANNER AND METHOD OF SCANNING

Michael T. Brooks, Veneta, and Craig D. Cherry, Eugene, both of Oreg., assignors to Spectra-Physics, San Jose, Calif.

Filed Nov. 1, 1989, Ser. No. 430,500
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—462 13 Claims



1. A method of scanning a pair of bar code labels to determine the bar code data printed thereon by repeatedly sweeping a beam in a succession of scanning passes, each label having a right segment defining right segment data and a left segment defining left segment data, and the left segment data and right segment data from each label combinable to form a valid checksum, comprising the steps of:

scanning the pair of labels to determine the left segment data of the pair of labels and the right segment data of the pair of labels,

if a left segment and a right segment were scanned during a single scanned pass across either or both of the pair of labels, storing an indication thereof,

selecting left segment data from a first left segment and right segment data from a first right segment and calculating a first checksum,

if the first checksum is valid, then selecting left segment data from said first left segment and right segment data from the second right segment and calculating a second checksum,

if the second checksum is valid, then selecting left segment data from the second left segment and right segment data from the first right segment and calculating a third checksum,

if the third checksum is valid, then selecting left segment data from said second left segment and right segment data from said second right segment and calculating a fourth checksum,

if the first, second, third, and fourth checksum data are valid, and if a left segment and a right segment were scanned a the beam made a single scanning pass across a pair of labels, then accepting the left segment and a right segment which were scanned as the beam made a single scanning pass across the pair of labels as providing scan data from the same label, and the other left segment and right segment as providing scan data from the other label, and

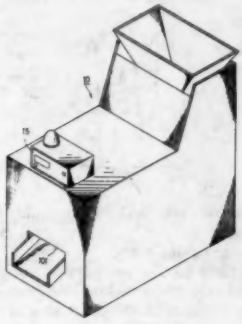
if the first, second, third, and fourth checksum data are valid, and if a left segment and a right segment were not scanned as the beam made a single scanning pass across either of the pair of labels, then rejecting the data from the first and second left segment and the first and second right segment.

4,963,720

APPARATUS FOR COUNTING LUMP FOODSTUFFS

Jiunn-Neng Jong, No. 656, Chung-Yuan Lane, Chu-Wei Tsun, Nei-Pu Hsiang, Pingtung Hsien, Taiwan

Filed Dec. 5, 1989, Ser. No. 446,078
Int. Cl.[5] G06M 7/04
U.S. Cl. 235—98 R 4 Claims



1. An apparatus for counting lump foodstuffs comprising:

a machine frame including a foodstuff feeding funnel fixed thereon;

a sheave unit, mounted rotatably on said machine frame under said funnel so as to receive said foodstuffs which drop from said funnel, having a plurality of parallel annular grooves formed in said as to drop all of said foodstuffs from a side of said sheave unit;

a conveyer belt unit, having a charge end disposed under said sheave unit which receives said foodstuffs dropping from said sheave unit, including two separate belt pulleys mounted rotatably on said machine frame, and a plurality of spaced-apart endless belts engaged with said pulleys so as to form a slot between each adjacent pair of said belts, each of said slots having a first end and a second end, said first ends of said slots corresponding to said charge end of said conveyer belt unit so as to receive said foodstuffs dropping from said sheave unit within said slots in said charge end of said conveyer belt unit, said pulleys effecting a unidirectional rotation so as to move said foodstuffs on said conveyer belt unit from said first ends of said slots to said second ends of said slots;

a foodstuff collecting unit disposed under said conveyer belt unit so as to collect said foodstuffs which drop from said conveyer belt unit; and

a plurality of counters on said frame respectively counting said foodstuffs which drop from one of said slots in said conveyer belt unit into said collecting unit;

whereby, said foodstuff dropping from said sheave unit can be dispersed on said conveyer belt unit so as to enable all of said foodstuffs to be counted by said counters.

4,963,721

ROTATABLE BAR CODE READER ARRANGEMENT FOR A CHECK OUT SYSTEM

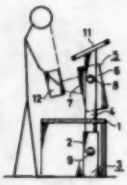
Mitsunori Kohno; Takao Umebara; Yukuo Kurimoto; Nobuhiko Fujii, and Hiromasa Akita, all of Shizuoka, Japan, assignors to Tokyo Electric Company, Ltd., Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,688

Claims priority, application Japan, Sep. 22, 1987, 62-144898[U]; Jul. 12, 1988, 63-092009[U]; Jul. 12, 1988 63-172895; Jul. 12, 1988, 63-172896; Jul. 12, 1988, 63-172897; Jul. 12, 1988, 63-172898; Jul. 12, 1988, 63-172899

Int. Cl.[5] G06K *7/10, 9/18*

U.S. Cl. 235—462 13 Claims



1. A rotatable bar code reader arrangement for a check out system comprising:

a support frame having sides;

a bar code reader having an operator side and a customer side respectively connected by side faces, a reading window being disposed on the operator side of the bar code reader;

attachment means for mounting the bar code reader on the support frame for rotation about a first axis of rotation;

a keyboard; and

a display having a display side and a side substantially opposite the display side which are respectively connected by side faces, the support frame being provided on both sides thereof with covering portions for covering the display when viewed sideways.

4,963,722

METHOD OF STORING A CONSUMED AMOUNT IN A CARD MEMORY

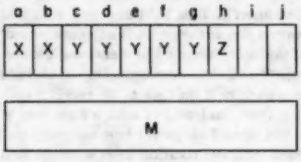
Satoshi Takeuchi, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Continuation of Ser. No. 865,013, May 20, 1986, abandoned. This application Dec. 14, 1988, Ser. No. 284,820

Claims priority, application Japan, May 20, 1985, 60-107929

Int. Cl.[5] G06K *1/12, 19/08*

U.S. Cl. 235—382.5 2 Claims



1. A data recording method in a card memory in which a consumed amount up to a predetermined natural number P is recorded, which comprises the steps of:

setting a predetermined natural number N so that said value P is exactly divisible by N and obtaining a quotient Q through a division of P/N;

providing a first recording area on said card memory having an adequate number of record bits (a through j) equal to the obtained quotient Q which are unchangeable when marked so as to provide high security;

providing a second recording area on said card memory having changeable memory means (M) and recording an initial value in said second recording area;

dividing said consumed amount by said natural number N so as to obtain a quotient q and a remainder;

recording said quotient q in said first recording area unchangeable by marking up to the same number of record bits as said quotient q;

reproducing a value recorded in said second recording area;

adding said remainder to said reproduced value so as to obtain a sum S; and

recording said sum S in said second recording area as a new value when S is less than N, and when S is at least as great as N, recording the difference S—N in said second recording area as a new value and marking one more record bit in said first recording area.

4,963,723

AUTOMATIC TOLL COLLECTOR FOR TOLL ROADS

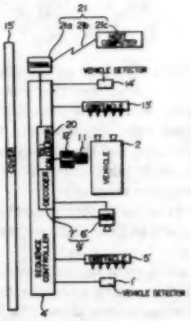
Shigeo Masada, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Nov. 10, 1988, Ser. No. 269,721

Claims priority, application Japan, Jun. 21, 1988, 63-151086

Int. Cl.[5] G06F *15/30, 15/48*

U.S. Cl. 235—384 11 Claims



1. An automatic toll collector for collecting tolls on a toll road comprising:

first decoding means disposed at an entrance toll gate of a toll road for recognizing the information contained in a distinctive marking on a vehicle entering said entrance toll gate, said distinctive marking uniquely identifying said vehicle;

a portable storage medium for storing information which identifies a bank account, said portable storage medium being transported along said toll road by said vehicle;

first information transfer means disposed at said entrance toll gate and responsive to said first decoding means for reading information which is stored in said portable storage medium and writing into said portable storage medium information for calculating tolls and information contained in said distinctive marking on said vehicle;

second decoding means disposed at an exit toll gate of said toll road for recognizing the information contained in said distinctive marking of said vehicle when said vehicle enters said exit toll gate;

second information transfer means disposed at said exit toll gate for reading the information which was written into said portable storage medium by said first information transfer means;

comparing and toll calculating means responsive to said second decoding means and said second information transfer means for selecting from the data which was read by said second information transfer means data which contains information which matches the information which

was recognized by said second decoding means and for calculating the toll from said entrance toll gate to said exit toll gate based on the selected data; and

toll withdrawal means for automatically withdrawing the calculated toll from said bank account which is identified by the information in said portable storage medium.

4,963,724

APPARATUS FOR PRODUCING AN OPTICAL IMAGE CONTRAST

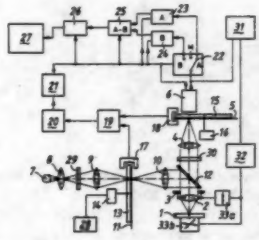
Burkhard Neumann, Wetzlar, Fed. Rep. of Germany, assignor to Wild Leitz GmbH, Wetzlar, Fed. Rep. of Germany

Filed Aug. 2, 1989, Ser. No. 388,375

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1988, 3826317

Int. Cl.[5] G01J *1/20*

U.S. Cl. 250—201.3 **20 Claims**



1. An apparatus for producing an optical image contrast, comprising:

a. a first screen;

b. a projection system for producing an image of said first screen in an object plane, said object plane being adapted for placement of an object therein;

c. a first device for producing a first relative movement between the image of said first screen and said object;

d. a second screen;

e. a system for imaging the object plane into the plane of said second screen, wherein the image of said first screen produced in the plane of said second screen is congruent with said second screen;

f. a second device for producing a second relative movement between the image of said object and said object wherein the image of the object and the image of said first screen in the plane of said second screen have different relative velocities at all times with respect to said second screen; and

g. a detection device for detecting light which passes through said second screen whereby the light has been spatially modulated due to the optical characteristics of said object in the object plane and temporally modulated as a result of the difference in angular velocity between said second screen and the image of said first screen produced at said second screen.

4,963,725

ADAPTIVE OPTICAL NEURAL NETWORK

John H. Hong, Moorpark, and Pochi A. Yeh, Thousand Oaks, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 24, 1989, Ser. No. 426,141

Int. Cl.[5] G01J *1/20*

U.S. Cl. 250—201.9 **14 Claims**

1. An adaptive optical network, comprising:

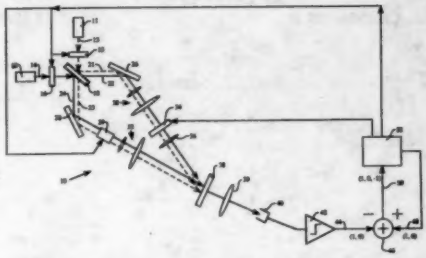
a source of coherent light;

means for splitting said light into first and second paths;

means for modulating the light in one of said paths with a predetermined pattern;

a holographic medium for receiving light from said paths and generating a hologram corresponding to said pattern;

means for detecting light from said hologram to generate an output signal;



means for comparing said output signal with a reference signal to produce an error signal; and

means for altering the phase of said light based on said error signal.

4,963,726

DEVICE FOR THE OPTICAL READING OF PLANAR INFORMATION CARRIERS

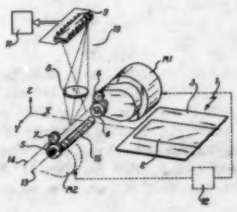
Maurizio Checchetti, Milan, Italy, assignor to Microptronics S.r.l., Milan, Italy

Filed May 3, 1989, Ser. No. 346,851

Claims priority, application Italy, May 19, 1988, 20641 A/88

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 **18 Claims**



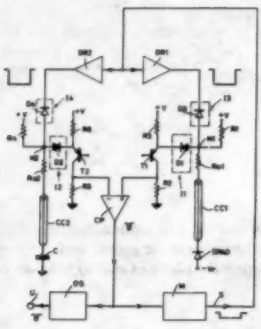
1. A device for transverse-scan optical reading of data stored on a moving flat information carrier, comprising at least a light source arranged to focus a light beam through a focusing means onto the carrier, sensing means for receiving said light beam after the interaction thereof with the carrier and for outputting information, means for processing the information from the sensing means, two independently driven electric motors, each equipped with a drive wheel and a cooperating idle roller engaging a side band of the carrier for advancing the carrier during reading, the rotation axes of said drive wheels and said rollers all lying in a main transverse plane perpendicular to the advancing direction of the carrier, wherein said plane further includes a reading line on the information carrier.

4,963,727

ACTIVE QUENCHING CIRCUIT FOR AVALANCHE PHOTODIODES

Sergio Cova, Milan, Italy, assignor to Consiglio Nazionale Delle Ricerche, Milan, Italy

Filed Oct. 18, 1989, Ser. No. 422,899
Claims priority, application Italy, Oct. 20, 1988, 22367 A/88
Int. Cl.[5] H01J 40/14
U.S. Cl. 250—214 R 12 Claims



1. An active quenching circuit for single photon semiconductor avalanche photodiodes, comprising:

a signal comparator (CP) having a first input connected to the photodiode (SPAD) under control and a second input connected to a balancing impedance (C) equal to that of the photodiode (SPAD);

a quenching signal generator (M) connected to the output of said comparator (CP) so as to generate a quenching signal (S) of the photodiode (SPAD), said quenching signal having a predetermined duration each time there is an imbalance between two inputs of the comparator; and,

circuit switching means (I1–I4) included in a connecting circuit to said photodiode (SPAD) and to said balancing impedance (C) at the inputs of said comparator (CP) and to the output of said generator (M), said circuit switching means (I1–I4) being driven by said quenching signal (S) so as to hold normally high the bias voltage of the photodiode (SPAD) and to lower it below the breakdown level for a predetermined time after the generation of said quenching signal (S).

4,963,728

COORDINATE MEASURING APPARATUS HAVING AN OPTICAL SENSING HEAD

Albrecht Hof; Wilhelm Ulrich; Lothar Rübl, and Klaus-Peter Koch, all of Aalen, Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Filed Oct. 5, 1989, Ser. No. 417,551
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1988, 3834117
Int. Cl.[5] H01J 5/16
U.S. Cl. 250—227.11 12 Claims

1. A coordinate measuring apparatus for making measurements on an object comprising:

a measuring arm;

an optical sensing head attached to said measuring arm;

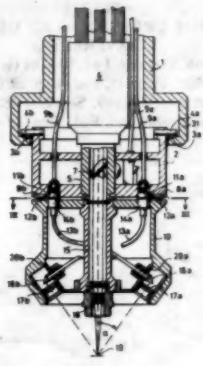
said sensing head including a holder and a detachable front optic unit conjointly defining a change interface whereat said front optic unit is attached to said holder;

said change interface including registration means for assuring that said detachable front optic unit can be reproducibly reattached to said holder;

a first set of light conductors arranged in said holder for conducting illuminating light;

a second set of light conductors arranged in said front optic unit for receiving the illuminating light conducted by said first set of light conductors;

light conductor coupling means disposed at said change interface for providing a low-loss coupling of the light conductors of said first set to corresponding ones of the light conductors of said second set;



an objective mounted in said front optic unit for receiving an image from the object; and,

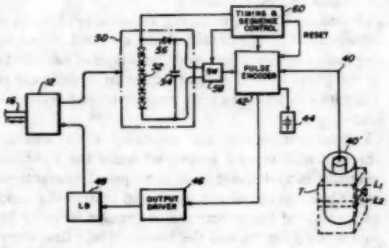
illuminating optic means adapted to said objective and optically connected to said second set of light conductors for receiving the light conducted therethrough to illuminate the object.

4,963,729

OPTICALLY POWERED SENSOR SYSTEM WITH IMPROVED SIGNAL CONDITIONING

William B. Spillman, Charlotte, and Richard P. Andresen, Shelburne, both of Vt., assignors to Simmonds Precision Products, Inc., Wilmington, Del.

Filed Mar. 3, 1989, Ser. No. 318,636
Int. Cl.[5] H01J 5/16
U.S. Cl. 250—227.21 25 Claims



14. An optically powered sensor comprising:

means for converting optical energy from an optical energy source to electricity and storing the electrical energy, a transducer having a capacitive characteristic that varies as a function of a parameter to be sensed, a reference component having a capacitance value that is independent of the parameter to be measured, circuit means for providing electrical energy from said converting and storing means to said transducer and said reference component for selectively integrating the capacitance values of said transducer and reference component to produce a multi-pulse output having first time attribute that is a function of the

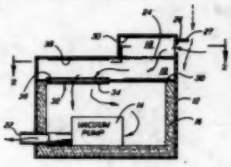
capacitance of said transducer and a second time attribute that is a function of the capacitance of said reference component.

4,963,730

RADON PROGENY DETECTOR

William C. Tetley, Syracuse; Bruce A. Cummings, Baldwinsville, and Daniel R. Westcott, North Syracuse, all of N.Y., assignors to RAD-X Ltd., Syracuse, N.Y.

Filed Mar. 20, 1989, Ser. No. 325,921
Int. Cl.[5] G01V 5/00; G01N 21/01
U.S. Cl. 250—253 14 Claims



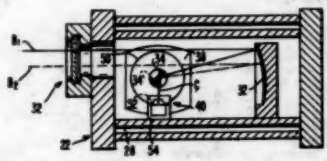
1. A radon progeny detector comprising first and second detection chambers connected together for smooth flow of an airstream therethrough, pump means for drawing a predetermined airstream through said first and second chambers, a diffusion screen mounted in said first chamber in the airstream so that the unattached radon progeny in the airstream diffuse onto the screen member, first radiation detecting means mounted on both sides of said diffusion screen in said first chamber, particle trapping means mounted in said second chamber to trap out attached radon progeny from said airstream, and second radiation detecting means mounted adjacent said particle trapping means, such that radiation from radon progeny captured by said screen member and said particle trapping means will impinge on said first and second radiation detecting means respectively.

4,963,731

OPTICAL LEVEL MEASUREMENT SYSTEM

Charles King, Elmira, N.Y., assignor to Courser, Incorporated, Elmira, N.Y.

Filed Aug. 11, 1989, Ser. No. 392,646
Int. Cl.[5] G01N 21/86
U.S. Cl. 250—560 8 Claims



1. An optical measuring system for measuring the surface level of a light-reflective material, comprising:

a detector unit including a fixed, parabolic mirror, and a rotatably mounted plane mirror having its axis of rotation at the focal point of said parabolic mirror, whereby a beam of light directed to the plane mirror from said parabolic mirror will be reflected in a circular path about said axis of rotation;

a source of light directing a beam of light along a predetermined path which includes the reflective surface of said light reflective material, said parabolic mirror, and said plane mirror;

index means responsive to the rotation of said plane mirror to produce an index signal for each revolution of said plane mirror;

a light-responsive detector lying in said circular path and responsive to said beam of light on said predetermined path for generating a beam signal during said index signal, said parabolic and plane mirrors being so related that variations in the surface level of said light-reflective material produces a corresponding variation in the time of occurrence of said beam signal with respect to said index signal;

clock means having a fixed clock rate;

logic circuit means driven by said clock means and responsive to said index signal to produce a train of index count pulses having a count corresponding to the duration of said index signal and responsive to said beam signal to produce a train of beam count pulses having a count corresponding to the time of occurrence of said beam pulse signal with respect to said index signal;

means determining the ratio of said beam count pulses to said index count pulses; and

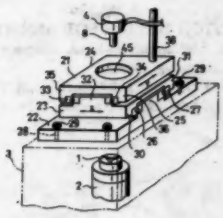
means responsive to said ratio for providing an indication of the level of the surface of said light-reflective material.

4,963,732

STRUCTURE FOR CONNECTING A ROTARY DETECTING DEVICE TO A ROTARY SHAFT

Osamu Saito, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1989, Ser. No. 400,176
Claims priority, application Japan, Dec. 28, 1988, 63-168322[U]
Int. Cl.[5] G01D 5/34
U.S. Cl. 250—231.13 4 Claims



1. A structure for providing relative positioning of a rotary detecting shaft of a rotary detecting device and a rotary shaft mounted to a frame, comprising:

a plate which can be fixed to the frame;

a first sliding plate movably mounted to the plate fixed to the frame so as to be movable relative to the plate fixed to the frame back and forth along a line; and

a second sliding plate movably mounted to the first sliding plate so as to be movable relative to the first sliding plate back and forth along a line at an angle to the first mentioned line of movement, the second sliding plate being fixable to the rotary detecting device.

4,963,733

INCREMENTAL ENCODER

Carl P. Spaulding, San Marino, Calif., assignor to TRJ & Company, Duarte, Calif.

Filed Jan. 9, 1989, Ser. No. 298,660
Int. Cl.[5] G01D 5/34
U.S. Cl. 250—231.16 25 Claims

1. An incremental encoder comprising:

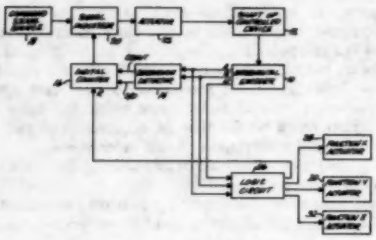
a rotatable disc having an axis of rotation:

a plurality of circumferentially arranged slots formed in the disc at equal angular increments;

light source means including a light transmitting aperture so positioned on one side of the disc as to illuminate the slots;

first light sensing means defining a first light receiving aperture positioned son the other side of the disc so as to receive light from the light transmitting aperture transmitted through the slots; and

second light sensing means defining a second light receiving aperture positioned on the other side of the disc so as to



receive from the light transmitting aperture light transmitted through the slots in quadrature phase relationship to the light received by the first sensor, the spacing between the first and second light receiving apertures being equal to ¼ the spacing between slots times the ratio of the distance between the light transmitting aperture and the light receiving apertures divided by the distance between the light transmitting aperture and the disc.

4,963,734

PROTECTION DEVICE FOR SENSOR MEANS

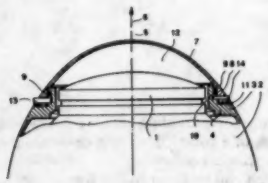
Ingemar Krantz, Linkoping, Sweden, assignor to Saab Missiles Aktieboleg, Linkoping, Sweden

Filed Oct. 31, 1989, Ser. No. 429,096

Claims priority, application Sweden, Nov. 18, 1988, 8804167

Int. Cl.[5] H01J *5/02*

U.S. Cl. 250—239 **6 Claims**



1. A protection device for sensor means having an active sensing direction carried by a vehicle such as a missile, characterized in that said device comprises a support carried by said vehicle with first flange means surrounding said sensor means about an axis disposed along said active sensing direction of the sensor means, further comprising a cap protecting the sensor means, said cap having second flange means, flexible sealing means disposed between said first and second flange means, said sealing means being arranged to create a seal between adjacent surfaces of said flange means to create a substantially gastight space partly defined by said cap and including the sensor means, at least one attaching means extending between said first and second flange means and arranged so that gas pressure generated within said space forces the cap to move relative to the sensor means with a component of movement in said active sensing direction and at least one component of movement perpendicular to said active sensing direction before said cap is released from said vehicle, the limiting surfaces of said flange means being so formed as to permit said movement.

4,963,735

PLASMA SOURCE MASS SPECTROMETER

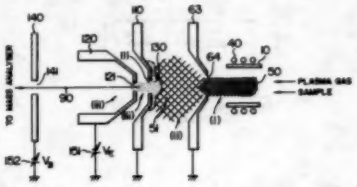
Yukio Okamoto, Sagamihara; Tsutomu Komoda, Tokyo; Satoshi Shimura; Seiichi Murayama, both Kokubunji, and Masataka Koga, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 7, 1989, Ser. No. 432,895

Claims priority, application Japan, Nov. 11, 1988, 63-283602; Feb. 3, 1989, 01-023835

Int. Cl.[5] H01J *49/12*

U.S. Cl. 250—288 **14 Claims**



1. A plasma source mass spectrometer comprising at least:

plasma generation means for generating a plasma in a high pressure region;

diffusion means including a plasma sampling electrode having a plasma sampling opening through which the plasma generated in the high pressure region is diffused into a moderate pressure region to produce a diffused plasma; and

ion extraction means for extracting ions from the diffused plasma, said ion extraction means including an ion extraction electrode for forming an ion sheath and an ion acceleration electrode.

4,963,736

MASS SPECTROMETER AND METHOD AND IMPROVED ION TRANSMISSION

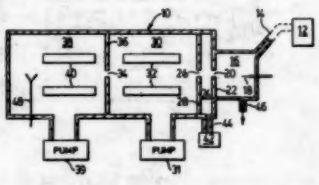
Donald J. Douglas, Toronto, and John B. French, Oakville, both off, Canada, assignors to MDS Health Group Limited, Etobicoke, Canada

Filed Nov. 15, 1989, Ser. No. 437,047

Claims priority, application Canada, Dec. 12, 1988, 585694

Int. Cl.[5] H01J *49/42*

U.S. Cl. 250—292 **24 Claims**



1. A mass spectrometer system comprising:

(a) first and second vacuum chambers separated by a wall, said first vacuum chamber having an inlet orifice therein,

(b) means for generating ions of a trace substance to be analyzed and for directing said ions through said inlet orifice into said first vacuum chamber,

(c) a first rod set in said first vacuum chamber extending along at least a substantial portion of the length of said first vacuum chamber, and a second rod set in said second vacuum chamber, each rod set comprising a plurality of

elongated parallel rod means spaced laterally apart a short distance from each other to define an elongated space therebetween extending longitudinally through such rod set, said elongated spaces of said first and second rod sets being first and second spaces respectively, said first rod set being located end to end with said second rod set so that said first and second spaces are aligned,

(d) an interchamber orifice located in said wall and aligned with said first and second spaces so that ions may travel through said inlet orifice, through said first space, through said interchamber orifice, and through said second space,

(e) means for applying essentially an AC-only voltage between the rod means of said first rod set so that said first rod set may guide ions through said first space,

(f) means for applying both AC and DC voltages between the rod means of said second rod set so that said second rod set may act as a mass filter for said ions,

(g) means for flowing gas through said inlet orifice into said first space,

(h) means for pumping said gas from each of said chambers,

(i) the pressure in said second chamber being a very low pressure for operation of said second rod set as a mass filter,

(j) the product of the pressure in said first chamber times the length of said first rod set being equal to or greater than 2.25×10^{-2} torr cm but the pressure in said first chamber being below that pressure at which an electrical breakdown will occur between the rod means of said first rod set,

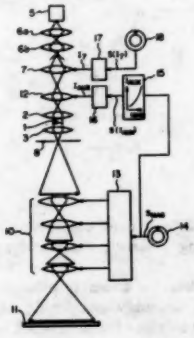
(k) and means for maintaining the kinetic energies of ions moving from said inlet orifice to said first rod set at a relatively low level, whereby to provide improved transmission of ions through said interchamber orifice.

4,963,737

TRANSMISSION ELECTRON MICROSCOPE

Seiichi Suzuki, Tokyo, Japan, assignor to JEOL Ltd., Tokyo, Japan

Filed Jun. 15, 1989, Ser. No. 366,692
Claims priority, application Japan, Jun. 17, 1988, 63-149655
Int. Cl.[5] H01J *37/26*
U.S. Cl. 250—311 9 Claims



1. A transmission electron microscope having an electron gun, a set of objective lenses holding a specimen therein, plural stages of focusing lenses for focusing the electron beam emitted from the electron gun onto the specimen, an aperture plate disposed at the position at which a crossover image is formed by the objective lenses, and an imaging lens system into which the electron beam passed through the aperture plate is introduced, said transmission electron microscope comprising:

a means for varying the intensity of the final-stage focusing lens;

an auxiliary lens disposed between the final-stage focusing lens and the set of objective lenses; and

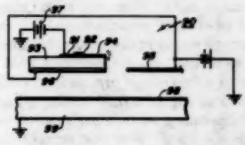
a means for varying the intensity of the auxiliary lens according to the intensity of the final-stage focusing lens so constructed and arranged that the position of the crossover image formed between the auxiliary lens and the set of objective lenses by the auxiliary lens can be fixed irrespective of the intensity of the final-stage focusing lens.

4,963,738

FLAT COMB-LIKE SCOROTRON CHARGING DEVICE

Robert W. Gundlach, Victor, and Richard F. Bergen, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 22, 1986, Ser. No. 945,044
Int. Cl.[5] H01T *19/04*; G03G *15/02*
U.S. Cl. 250—326 25 Claims



1. A charging device adapted to apply a uniform charge to a charge retentive surface, comprising:

a corona resistant dielectric support substrate;

ruthenium oxide in a glass or ceramic binder corona producing means extending to an edge of said dielectric support substrate and adapted to produce corona at said edge; and

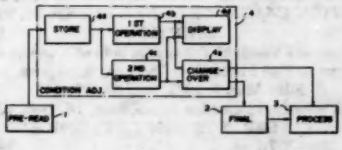
high voltage means connected to said corona producing means and adapted to apply sufficient voltage to said corona producing means that corona ions are emitted from said corona producing means at said edge of said dielectric support substrate.

4,963,739

RADIATION IMAGE READ-OUT APPARATUS

Kazuhiro Hishinuma, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 31, 1989, Ser. No. 330,859
Claims priority, application Japan, Mar. 31, 1988, 63-80068; Jul. 28, 1988, 63-188980
Int. Cl.[5] G01N *23/04*
U.S. Cl. 250—327.2 5 Claims



1. A radiation image read-out apparatus comprising:

(i) a preliminary read-out means for scanning a stimulable phosphor sheet, on which a radiation image has been stored, with a light beam in order to release part of the energy stored during exposure to radiation as light emitted from said stimulable phosphor sheet, detecting the light emitted by said stimulable phosphor sheet, and obtaining a preliminary read-out image signal which approximately represents said radiation image,

(ii) a final read-out means for scanning said stimulable phosphor sheet with a light beam having an energy level higher than that of said light beam used in said preliminary

read-out means, detecting light emitted by said stimulable phosphor sheet when it is thus scanned, and obtaining a final read-out image signal which represents said radiation image,

(iii) an image processing means for receiving said final read-out image signal and carrying out image processing of said final read-out image signal, and

(iv) a condition adjusting means for receiving said preliminary read-out image signal, adjusting a read-out condition to be used in detection of said final read-out image signal and/or an image processing condition to be used in image processing, said adjustment being effected on the basis of information carried by said preliminary read-out image signal, and feeding said read-out condition into said final read-out means and/or feeding said image processing condition into said image processing means,

wherein said condition adjusting means is constituted of:

(a) a storage section for storing said preliminary read-out image signal,

(b) a first operating section for reading said preliminary read-out image signal from said storage section, carrying out a first operating process based on said preliminary read-out image signal in order to calculate a first read-out condition to be used in detection of a final read-out image signal and/or a first image processing condition to be used in image processing of a final read-out image signal,

(c) a second operating section for reading said preliminary read-out image signal from said storage section, carrying out a second operating process, which is different from said first operating process, based on said preliminary read-out image signal in order to calculate a second read-out condition to be used in detection of a final read-out image signal and/or a second image processing condition to be used in image processing of a final read out image signal,

(d) a displaying section for receiving and displaying both said first read-out condition and/or said first image processing condition and said second read-out condition and/or said second image processing condition, and

(e) a change-over section for receiving said first read-out condition and/or said first image processing condition, and said second read-out condition and/or said second image processing condition, and selectively activating either one of a mode wherein said first read-out condition is fed into said final read-out means and/or said first image processing condition is fed into said image processing means, and a mode wherein said second read-out condition is fed into said final read-out means and/or said second image processing condition is fed into said image processing means.

4,963,740

SUBTRACTION PROCESSING METHOD FOR RADIATION IMAGES OBTAINED UNDER DIFFERENT CONDITIONS

Eiichi Asai, and Yoshiaki Yokoyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 9, 1989, Ser. No. 321,123

Claims priority, application Japan, Mar. 14, 1988, 63-59613

Int. Cl.[5] G03C *5/15*; G06F *15/68*; G03B *42/00*

U.S. Cl. 250—327.2 **4 Claims**

1. A subtraction processing method used when reproducing radiation images, which comprises the steps of:

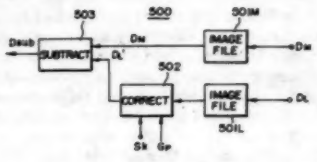
(i) obtaining a masked image signal by reading out a radiation image of an object, which radiation image acts as a masked image and has been recorded without the injection of contrast media into a specific structure of said object,

(ii) obtaining a live image signal by reading out a radiation image of said object, which radiation image acts as a live image and has been recorded after contrast media have been injected into said specific structure of said object, and

(iii) subtracting the parts of said masked image signal and said live image signal from each other which represent corresponding picture elements in said masked image and said live image, thereby obtaining a difference signal from which an image of said specific structure can be formed,

wherein the improvement comprises the steps of:

(a) in cases where read-out conditions used for obtaining said masked image signal and those used for obtaining said live image signal are different from each other, carrying out



conversion processing on one of said masked image signal or said live image signal so that the image signal is converted into the image signal which would have been obtained if the read-out conditions used to obtain both image signals were equal, and

(b) carrying out subtraction processing on the image signal obtained by conversion processing and said other image signal.

4,963,741

LARGE AREA PYROELECTRIC JOULEMETER

John C. McMullin, San Jose, Calif., assignor to Molectron Detector, Inc., Portland, Oreg.

Filed Jun. 22, 1987, Ser. No. 65,225

Int. Cl.[5] G01J *1/00*

U.S. Cl. 250—338.3 **15 Claims**

1. A pyroelectric joulemeter comprising:

a housing having a main portion and an apertured bezel portion;

a pyroelectric detector assembly mounted in said housing, said detector assembly comprising an electrically and thermally conductive mounting block removably secured to said main portion of said housing, and a pyroelectric detector element, said detector element having a first electrically conductive face secured to a face of said mounting block and electrically isolated therefrom by a thermally conductive, electrically insulative adhesive and a second electrically conductive face exposed to ambient via said apertured bezel, said second electrically conductive face being electrically coupled to said mounting block; and

an output connector electrically coupled to said detector element for supplying signals therefrom.

4,963,742

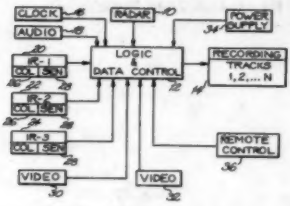
LEAK DETECTION AND MULTISPECTRAL SURVEY SYSTEM

Donald A. Abernathy, 2505 Wilkinson Rd., Sarasota, Fla. 33581

Continuation of Ser. No. 250,981, Sep. 26, 1988, abandoned, which is a continuation of Ser. No. 28,471, Mar. 20, 1987, abandoned. This application Oct. 18, 1989, Ser. No. 423,624

Int. Cl.[5] G01N *21/35*

U.S. Cl. 250—338.5 12 Claims



1. A multispectral survey system comprising:

first sensor means for producing an electric signal representative of the intensity of radiation received in a first band of the electromagnetic spectrum;

first radiation collection means for collecting electromagnetic radiation from a first selected field of view and delivering it to said first sensor means;

first recording means for receiving and recording said electric signals produced by said first sensor means;

first video camera means having a field of view substantially the same as said first selected field of view for producing electric signals representative of the visible radiation received from said first field of view;

second recording means for receiving and recording said electric signals produced by said first video camera means;

second video camera means having a field of view wider than said first selected field of view for producing electric signals representative of the visible radiation received from said second field of view;

third recording means for receiving and recording said electric signals produced by said second video camera means; and

synchronizing means for synchronizing the recording of signals produced by said first sensor means and said first and second video camera means.

11. A process for detecting leaks from a pipeline comprising:

recording simultaneously radiation received in at least a first band of the electromagnetic spectrum and two different visual images along a flight path including the pipeline;

identifying in the recorded electromagnetic spectral radiation, locations containing temperatures which are extrathreshold;

examining locations in the recorded visual images corresponding to the identified locations in the recorded electromagnetic spectral radiation to determine nonleak causes of the extrathreshold temperatures;

listing locations for which causes of the extrathreshold temperatures have not been determined; and

performing an on site inspection of the listed locations to identify the causes of the extrathreshold temperatures.

4,963,743

APPARATUS FOR EVALUATING QUALITY OF RAW COFFEE BEANS

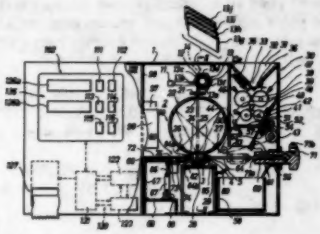
Toshihiko Satake, Hiroshima; Setoru Satake, Tokyo, and Yukio Hosaka, Hiroshima, all of Japan, assignors to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1989, Ser. No. 421,849

Claims priority, application Japan, Oct. 15, 1988, 63-260315; Oct. 29, 1988, 63-274269

Int. Cl.[5] G01N *21/35*

U.S. Cl. 250—339 13 Claims



1. An apparatus for evaluating quality of raw coffee beans, comprising:

pulverizing means for pulverizing the raw coffee beans to form sample coffee powder;

a sample container located at a predetermined measuring position with the sample coffee powder to be evaluated being contained in said sample container;

a near-infrared spectrometer including a light source for applying light to said sample coffee powder, optical means located between said light source and said sample coffee powder for permitting passage of near-infrared light beam having its specific wavelength, of the light from said light source, and luminous-intensity detecting means for detecting luminous intensity of the light reflected from and/or transmitted through said sample coffee powder to generate a signal representative of the luminous intensity; and

control means including memory means for storing therein at least one of characteristic coefficients and appraisal coefficients and said sample coffee powder, and calculation means for calculating at least one of characteristic values and appraisal values of said raw coffee beans, based on said stored coefficients and said signal from said luminous-intensity detecting means.

4,963,744

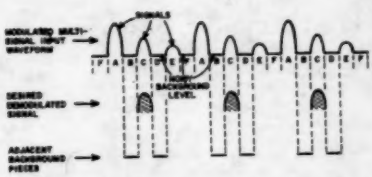
METHOD AND APPARATUS FOR PROVIDING ACCURATE LOW NOISE DEMODULATION

Robert J. Matthys, Minneapolis, Minn., assignor to Gas Research Institute, Chicago, Ill.

Filed Jun. 26, 1989, Ser. No. 371,200

Int. Cl.[5] G01N *21/17, 21/35, 21/61*

U.S. Cl. 250—343 7 Claims


SIGNALS
MODULATED MULTI-SIGNAL INPUT WAVEFORM
F A B C D E F A B C D E F A B C D E F
NOISY BACKGROUND LEVEL
DEMODULATED SIGNAL
ADJACENT BACKGROUND PIXELS

1. Apparatus for accurate low noise demodulation of a modulated multi-signal input waveform, wherein the waveform

includes a plurality of sequential signal pulses having a first adjacent background signal immediately preceding and a second adjacent background signal immediately following each signal pulse, wherein the apparatus comprises:

(a) means for amplifying the modulated multi-signal input waveform;

(b) means for synchronously separating the sequential signal pulses and their adjacent background signals into a plurality of channels according to sequence order; and

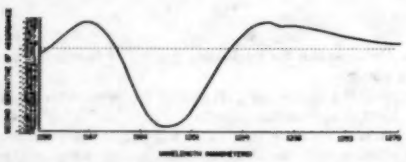
(c) means for synchronously demodulating each sequential signal pulse in each channel including means for averaging the first and second adjacent background signals for each pulse to yield an adjacent average background signal for each pulse and means for subtracting each sequential signal pulse from the adjacent average background signal.

4,963,745

OCTANE MEASURING PROCESS AND DEVICE

Steven M. Maggard, Huntington, W. Va., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 1, 1989, Ser. No. 402,959
Int. Cl.[5] G01N *21/59*
U.S. Cl. 250—343 18 Claims



1. In a process for the determining of octane number or other measure of knock avoidance of a fuel by near infrared range spectroscopy, the improvement comprising determining said octane number or other measure of knock avoidance by:

a. measuring absorbance in the t-butylmethyne band;

b. periodically or continuously outputting a periodic or continuous signal indicative of the intensity of said absorbance in said band or one mathematical function or a combination of mathematical functions thereof; and

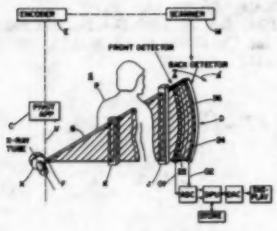
c. mathematically converting said signal to an output signal indicative of said octane number or other measure of knock avoidance of said fuel.

4,963,746

SPLIT ENERGY LEVEL RADIATION DETECTION

Douglas R. Morgan, and Richard A. Sones, both of Cleveland Heights, Ohio, assignors to Picker International, Inc., Cleveland, Ohio

Filed Nov. 25, 1986, Ser. No. 936,464
Int. Cl.[5] G01T *1/16*
U.S. Cl. 250—363.02 29 Claims



1. An energy discriminating radiation detector comprising:

(a) a first component comprising a first material comprising a primary x-ray absorbing element having an atomic number in the range of 29 to 48 inclusively which is preferentially responsive to penetrative radiation of a first energy range;

(b) a second component comprising a second material comprising a primary x-ray absorbing element having an atomic number in the range of 61 to 68 inclusively and which is preferentially responsive to penetrative radiation of a second energy range different from said first energy range, said second component being positioned to receive radiation which has penetrated through a portion of said first component; and

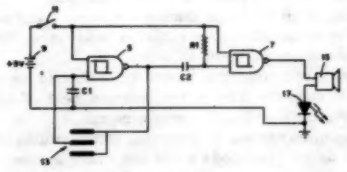
(c) a penetrative radiation filter member interposed between said first and second components, said filter member comprising a non-cuprous material having an atomic number lying in the range of 26 to 50 inclusively.

4,963,747

IONIZING RADIATION DETECTOR

Louis H. Thacker, Knoxville, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 8, 1989, Ser. No. 363,032
Int. Cl.[5] G01J *1/185*
U.S. Cl. 250—388 7 Claims



1. An ionizing radiation detector, comprising:

first and second switching means each having first and second inputs and an output and each capable of operating in one of a first state and a second state as indicated by corresponding first and second signal levels at the output thereof in response to signal levels applied to said second input exceeding upper and lower threshold switching levels, respectively, determined by the signal level of a reference signal applied to said first input thereof, said second input of said second switching means being coupled to the output of said first switching means so that said second switching means switches states from said first state to said second state momentarily each time said first switching means switches from said second state to said first state;

means for applying said reference signal level to said first inputs of said first and second switching means;

an ionizing radiation responsive means connected between the output and said second input of said first switching means and including a charge storage means which is charged at a rate corresponding to the level of radiation being detected for alternately switching said first switching means between said first and second states at a rate depending upon the level of ionizing radiation detected; and,

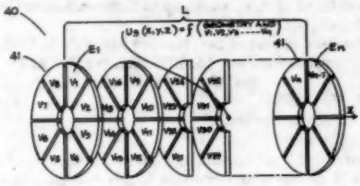
an indicating means coupled to the output of said second switching means for indicating the level of radiation being detected in response to the switching rate of said second switching means.

4,963,748

COMPOSITE MULTIPURPOSE MULTIPOLE ELECTROSTATIC OPTICAL STRUCTURE AND A SYNTHESIS METHOD FOR MINIMIZING ABERRATIONS

Miklos N. Szilagyi, Tucson, Ariz., assignor to Arizona Technology Development Corporation (ATDC), Tucson, Ariz.

Filed Jun. 6, 1988, Ser. No. 202,261
Int. Cl.[5] H01J 3/12, 3/18, 3/26
U.S. Cl. 250—396 R 14 Claims



1. A composite electrostatic optical apparatus for use as optical structures functioning as electrostatic deflectors and focusing electrostatic lenses and being used for minimizing the aberrations of a charged partical beam in an optical column containing said optical structures, said composite electrostatic optical apparatus comprising:

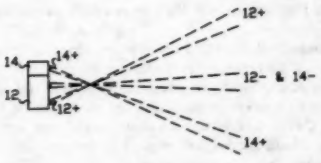
any one of said optical structures being formed from a series of at least two electrostatic units arranged along an optical column axis, each one of said units comprising an arrangement of a plurality of electrically insulated electrodes arranged on a common plane around said optical column axis, each one of said plurality of electrodes having an electrical conducting means for receiving a voltage that combines with other electrode voltages in said series of at least two electrostatic units to produce a continuous and controllable three-dimensional potential distribution within any one of said optical structures that is variable along said axis and that reduces aberrations.

4,963,749

QUAD ELEMENT INTRUSION DETECTION

Richard L. McMaster, Pittsford, N.Y., assignor to Detection Systems, Inc., Fairport, N.Y.

Filed Feb. 28, 1989, Ser. No. 316,764
Int. Cl.[5] G01J 5/18
U.S. Cl. 250—349 8 Claims



1. A dual channel intrusion detection system comprising:

a first radiation sensor having a pair of elements viewing adjacent zones slightly offset from each other in the direction of expected intruder movement;

a second radiation sensor having a pair of elements viewing adjacent zones slightly offset from each other in the direction of expected intruder movement; and

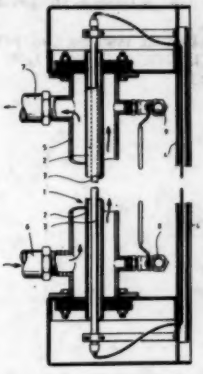
sequence detection means for producing an intruder-present signal in response to substantially simultaneous actuation of one of the elements of each sensor when preceded by actuation of the other element of only one of the sensors.

4,963,750

FLUID MEDIA STERILIZATION APPARATUS

Robert L. Wilson, 122 Fulton Road, Blackburn South, Victoria, 3130, Australia

PCT No. PCT/AU87/00417, § 371 Date Aug. 8, 1988, § 102(e) Date Aug. 8, 1988, PCT Pub. No. WO88/04281, PCT Pub. Date Jun. 16, 1988
PCT Filed Dec. 9, 1987, Ser. No. 265,804
Claims priority, application Australia, Dec. 9, 1986, PH09393
Int. Cl.[5] G01N 21/05
U.S. Cl. 250—436 8 Claims



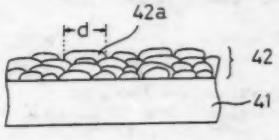
1. An irradiation unit for the sterilization of fluid media, said unit including: an irradiation tube constructed of a material transparent to germicidal radiation and having coated externally thereon or attached thereto a sleeve or layer of a material which is substantially transparent to germicidal ultra-violet radiation but to which impurities contained in said fluid media do not stick, said tube having a source of germicidal ultra-violet radiation disposed internally and substantially centrally thereof; and a housing of a complementary shape to said tube and disposed substantially coaxially therewith, said housing being of a larger dimension than said tube, the arrangement being such that an annular space is provided between said tube and said housing, said annular space providing a flow path for said fluid media, said annular space being in the range of from 15 to 25 mm in width.

4,963,751

RADIATION IMAGE STORAGE PANEL AND METHOD FOR PREPARING THE SAME

Akiko Kano; Hisanori Tsuchino; Kuniaki Nakano; Fumio Shimada, and Satoshi Honda, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Aug. 4, 1988, Ser. No. 228,250
Claims priority, application Japan, Aug. 17, 1987, 62-204909; Jun. 13, 1988, 63-143638
Int. Cl.[5] G03B 42/00
U.S. Cl. 250—484.1 12 Claims



1. A radiation image storage panel, which comprises a sup-

port, a flame-sprayed layer and a stimulable phosphor layer formed by a vapor phase build-up method in succession;

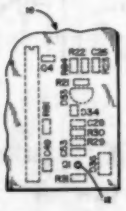
said flame sprayed layer being formed of material having an average particle size of 5 to 30 μm and a void according to JIS (Japanese Industrial Standard) H 8200 of 10% or less.

4,963,752

METHOD FOR DETECTING MISSING CIRCUIT BOARD COMPONENTS

William R. Landis, Bloomington, and Peter Bradford, Maple Grove, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 30, 1988, Ser. No. 292,487
Int. Cl.[5] G07C 3/14; G01J 1/38, 5/54
U.S. Cl. 250—459.1 8 Claims



1. A method for detecting empty component locations on an assembled circuit board, where the component locations are marked with spots of a fluorescent substance before assembly, the method comprising the steps of:

exposing the circuit board to stimulating radiation which is emitted by a radiation source causing luminescence from the spots of fluorescent substance on which the stimulating radiation is impinged; and

examining the circuit board for the luminescence to determine whether the components are between the spots and the radiation source.

4,963,753

X-RAY INTENSIFYING SCREEN INCLUDING A TITANIUM ACTIVATED HAFNIUM DIOXIDE PHOSPHOR CONTAINING GADOLINIUM TO REDUCE AFTERGLOW

Philip S. Bryan, Webster; Patrick M. Lambert, Rochester; Christine M. Towers, Rochester, and Gregory S. Jarrold, Henrietta, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 305,222, Feb. 3, 1989. This application Nov. 16, 1989, Ser. No. 437,143
Int. Cl.[5] C09K 11/67
U.S. Cl. 250—483.1 11 Claims

1. A screen comprised of

a support and

a fluorescent layer containing a phosphor capable of absorbing X-radiation and emitting longer wavelength electromagnetic radiation comprised of monoclinic crystals of a titanium activated hafnium dioxide phosphor host, characterized in that the monoclinic crystals consist essentially of oxygen and combined elements satisfying the relationship

$$Hf_{1-x}Zr_xTi_zM_yGd_w$$

wherein

M represents at least one alkali metal;

w is in the range of from 2×10^{-6} to 1×10^{-2};

x is in the range of from 3×10^{-4} to 1.0;

y is up to 1; and

z is up to 0.3,

the phosphor exhibiting a reduced afterglow when excited by X-radiation as compared to the phosphor as defined above absent gadolinium.

4,963,754

X-RAY INTENSIFYING SCREEN INCLUDING A TITANIUM ACTIVATED HAFNIUM DIOXIDE PHOSPHOR CONTAINING THULIUM TO REDUCE AFTERGLOW

Philip S. Bryan, Webster; Patrick M. Lambert, Rochester; Christine M. Towers, Rochester, and Gregory S. Jarrold, Henrietta, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 305,222, Feb. 3, 1989. This application Nov. 16, 1989, Ser. No. 437,423
Int. Cl.[5] C09K 11/67
U.S. Cl. 250—483.1 11 Claims

1. A screen comprised of

a support and

a fluorescent layer containing a phosphor capable of absorbing X-radiation and emitting longer wavelength electromagnetic radiation comprised of monoclinic crystals of a titanium activated hafnium dioxide phosphor host,

characterized in that the monoclinic crystals consist essentially of oxygen and combined elements satisfying the relationship

$$Hf_{1-x}Zr_xTi_zM_yTm_w$$

wherein

M represents at least one alkali metal;

w is in the range of from 1×10^{-6} to 1×10^{-3};

x is in the range of from 3×10^{-4} to 1.0;

y is up to 1; and

z is up to 0.3,

the phosphor exhibiting a reduced afterglow when excited by X-radiation as compared to the phosphor as defined above absent thulium.

4,963,755

METHOD FOR ENHANCEMENT OF USEFUL LUMINESCENCE FROM VACANCY DEFECTS IN REFRACTORY OXIDES FOR TUNABLE LASERS

Yok Chen, Oak Ridge, Tenn., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Sep. 12, 1988, Ser. No. 243,534
Int. Cl.[5] C09K 11/55, 11/67
U.S. Cl. 250—492.3 3 Claims

1. A method of preparing a refractory oxide laser host material having high quantum efficiency, high thermal stability, and high useful luminescence in the nanoseconds range comprising the steps of:

(a) removing substantially all of the hydrogen from a single crystal of said refractory oxide to a level of less than about 10^{13} protons/cm^3 by the simultaneous steps of heating said crystal to a temperature sufficient to dissociate hydrogen from OH— bonds within said crystal and applying an electric field across said crystal to sweep the dissociated hydrogen ions from said crystal;

(b) further heating said crystal in an atmosphere of a cation vapor of said refractory oxide at an elevated pressure and temperature sufficient to thermochemically reduce the oxygen content of said crystal to form oxygen (anion) vacancies within said crystal so that F+ luminescence is produced when said crystal is optically excited by light of a wavelength within the absorption band of said crystal, said temperature being sufficient to remove contaminants by means of outdiffusion during thermochemical reduction of the oxygen in said crystal, thereby preventing crystal darkening; and

(c) irradiating said crystal with electrons sufficient to inactivate trace amounts of H— ions, thereby improving the

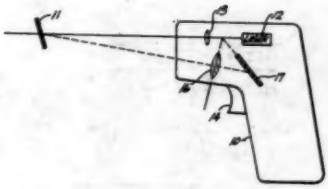
ratio of short-lived to long-lived luminescence following optical excitation.

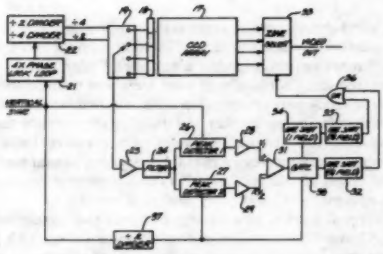
4,963,756

FOCUSED LINE IDENTIFIER FOR A BAR CODE READER

Ronald Quan, Cupertino, and Brian J. Bayley, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 13, 1989, Ser. No. 421,520
Int. Cl.[5] G06K *7/10*
U.S. Cl. 250—568 **33 Claims**





27. A method for operating a bar code reader having a two dimensional array of photodetectors for generating a train of signals representing scan lines across the array comprising the steps of:

identifying by analog means a line in the train of signals having the sharpest focus of light reflected from the bar code onto the array of photodetectors; and

gating a train of signals representing the identified line to a digitizer.

4,963,757

APPARATUS FOR SENSING A CHARACTERISTIC OF A TRAVELING YARN

Yvan V. Liefde, Zottegem; Marcel de Vuyst, Waregem, both of Belgium, and Peter Goetsches, Monchengladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Dec. 22, 1988, Ser. No. 289,208
Claims priority, application European Pat. Off., Dec. 24, 1987, 87119212
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—571 **26 Claims**

1. An apparatus for sensing a characteristic of a traveling yarn, comprising:

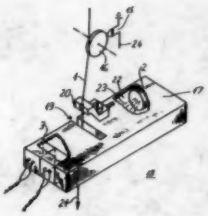
a light emitting element;

a pair of light sensing elements for producing signals in response to sensed light, said pair of light sensing elements being in opposed relation to said light emitting element such that a slot is defined therebetween;

said light emitting element providing a continuos luminous field within said slot extending across the combined extent of said light sensing elements;

means for guiding yarn through said continuous luminous field relative to said pair of light sensing elements such that the yarn casts a shadow only on a selected one of said pair of light sensing elements; and

data processing means, connected to said pair of light sensing elements, for receiving said signals from said light



sensing elements, said data processing means developing a control value corresponding with said signal received from said light sensing element which is not shadowed by the yarn, developing a shadow value corresponding to said signal received from said selected one light sensing element and comparing said control value to said shadow value to determine a predetermined characteristic of the yarn.

4,963,758

METHOD OF MAKING COMPACTS CONTAINING PRECISE AMOUNTS OF NUCLEAR FUEL

Robert C. Noren, San Diego, and Richard P. Vanek, Solana Beach, both of Calif., assignors to General Atomics, San Diego, Calif.

Filed Oct. 17, 1988, Ser. No. 258,520
Int. Cl.[5] G21C *21/00*
U.S. Cl. 264—0.5 **6 Claims**

1. A method of making nuclear fuel compacts containing precise amounts of nuclear fuel, which method comprises

coating generally spherical cores of fissile or fertile nuclear fuel material with a surrounding fission-product retention barrier including a plurality of different layers,

depositing a relatively low density protective overcoating exterior of said fission-product-retention barrier,

depositing a thin layer of relatively dense material upon the surface of said protective overcoating from a vapor atmosphere under conditions so that the resultant nuclear fuel particles have an outermost encapsulating shell having a thickness of at least about 2 microns,

metering said nuclear fuel particles to form charges containing a precise amount of nuclear fuel desired for a particular compact, by measuring the volume and/or weight of accumulated nuclear fuel particles,

loading said charges into confined spaces, and

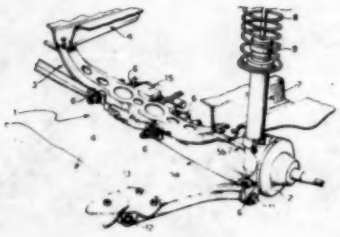
filling the remainder of the confined space not occupied by said nuclear fuel particles with a fluid, hardenable binder by injection into the interstices thereof and then hardening the binder to form solid nuclear fuel compacts containing a precise amount of nuclear fuel, whereby said thin, dense, encapsulating shells prevent the abrasion of said relatively low density protective overcoating material and thereby assure continuous metering of precise amounts of nuclear fuel in each charge over extended periods of operation.

4,963,759

MCPHERSON-TYPE MOTOR-VEHICLE SUSPENSION

Sergio Leonti, and Lorenzo Garro, both of Torino, Italy, assignors to Fiat Auto S.p.A., Torino, Italy

Filed Apr. 13, 1989, Ser. No. 337,697
Claims priority, application Italy, Apr. 19, 1988, 67365 A/88
Int. Cl.[5] B62D 7/00
U.S. Cl. 280—691 3 Claims



1. A rear suspension for motor vehicles, in which each wheel support (2) is connected to a McPherson-type upright (7) and is also guided by means of a front transverse arm (5a) and a rear transverse arm (5b) whose ends are articulated to the body (4) and to the wheel support (2) respectively,

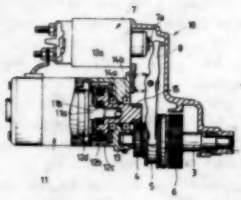
wherein the articulations (6) of the ends of the transverse arms comprise ball joints or resilient bushes and that one of the two arms (5a, 5b) associated with each wheel is connected to hydraulic actuator means (15) for controlling the position of the arm in a transverse direction to provide rear wheel steering.

4,963,760

STARTER FOR ENGINE

Takeshi Sugiyama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 4, 1989, Ser. No. 293,780
Claims priority, application Japan, Jan. 20, 1988, 63-6584[U]
Int. Cl.[5] F02N 11/00
U.S. Cl. 290—48 5 Claims



1. A starter comprising:

an electric motor, comprising an armature shaft, which produces torque on said shaft for starting an engine;

a speed reduction planet gear unit in which a carrier by which a plurality of planet gears are rotatably supported is integrally formed with a rotary shaft disposed coaxially with said armature shaft of said motor, so that said rotary shaft is rotated at a lower speed than said armature shaft as the torque of said armature shaft is transmitted to said rotary shaft;

a gear formed on said rotary shaft;

an output rotary shaft provided with a speed reduction gear engaged with said gear formed on said rotary shaft;

an overrunning clutch slidably supported on said output rotary shaft; and

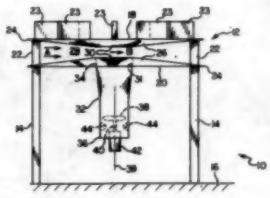
a pinion supported on said output rotary shaft so that said pinion can be engaged with and disengaged from the ring gear of said engine and can be rotated by the torque of the inner member of said clutch.

4,963,761

WIND-DRIVEN POWER GENERATOR

C. Calvin Wight, 1496 Lakewood Ave., Lakewood, Ohio 44107

Filed Feb. 1, 1989, Ser. No. 304,960
Int. Cl.[5] F03D 5/00
U.S. Cl. 290—55 13 Claims



1. A wind-driven power generator, comprising:

a. a substantially horizontal roof including upper and lower roof members each having a peripheral edge and a pressure reducing surface, said roof members being disposed in a spaced-apart relationship with said pressure reducing surfaces facing each other and defining an air space therebetween, the distance between said pressure reducing surfaces varying from a maximum spacing at said peripheral edges of said roof members to a minimum spacing at an intermediate location of said roof members;

b. a vertical suction pipe having an upper end connected to said lower roof member in flow communication with said air space at said intermediate location of said lower roof member and a lower end extending downwardly from said lower roof member; and

c. an impeller disposed in said suction pipe at said lower end thereof, said impeller rotating when air flows horizontally through said air space, the horizontal air flow creating a pressure reduction in said air space at said upper end of said suction pipe and drawing air up through said suction pipe to rotate said impeller.

4,963,762

EVACUATION CHAIR

Royce L. Brooks, Benicia, Calif., assignor to Norman D. Koerner, Benicia, Calif.

Continuation of Ser. No. 750,993, Jul. 2, 1985, Pat. No. 4,711,487, which is a continuation of Ser. No. 349,913, Feb. 18, 1982, abandoned. This application Oct. 23, 1987, Ser. No. 112,539
The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.
Int. Cl.[5] A61G 1/00; A47C 4/00
U.S. Cl. 297—183 2 Claims

1. An evacuation chair for manually transporting a handicapped person in a seated position, comprising

a chair having seat and back and leg portions,

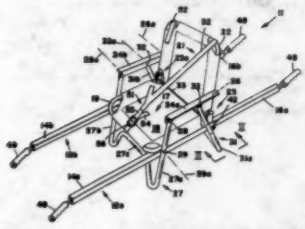
a pair of elongated straight carrier members mounted on opposite sides of and secured to the seat of said chair and extending forwardly and rearwardly therefrom along parallel singular axes,

manually graspable handle means formed on the ends of said carrier members including a pair of hand grips secured to and extending longitudinally downwardly from the forward ends of said carrier members at an angle to said

carrier members in excess of ten degrees and a pair of hand grips secured to and extending longitudinally upwardly from the rearward ends of said carrier members at an angle to said carrier members in excess of ten degrees,

said leg portions including forward and rearward pairs of legs and being pivotally attached to said carrier members, said pairs of legs extending upwardly past the seat portion of said chair with the upper ends thereof forming front and rear arm support portions joined to arm rests,

rotatable ground engaging wheels mounted on the lower ends of said rear pair of legs,



articulation means formed for permitting simultaneous folding of said seat and chair back and arm rest and arm support portions and said leg portions from operating to collapsed positions flat adjacent to said carrier members, said articulation means being effected by pivotal attachment of said forward and rearward pairs of legs to said carrier members and pivotal attachment of said arm rests to the upper ends of said arm support portions and to said back portion, and

latch means disposed proximate the intersections of said chair back and rear arm support portions and said carrier members formed for releasably holding said chair back and said leg portions in operating position.

4,963,763

LOAD CONTROL SYSTEM AND METHOD FOR DISCONNECTING SUB-BUS FROM MAIN-BUS

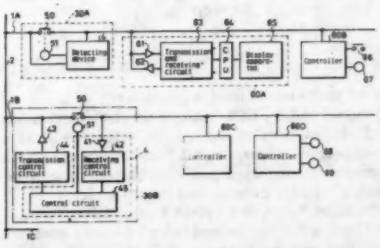
Yoshiji Minagawa; Hiroshi Shirakawa; Hiroshi Yamazaki, and Yoshiaki Ito, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo-to, Japan

Filed Sep. 9, 1987, Ser. No. 94,649

Claims priority, application Japan, Sep. 9, 1986, 61-212461; Sep. 12, 1986, 61-215450; Nov. 13, 1986, 61-270306

Int. Cl.[5] H04Q *9/00*

U.S. Cl. 307—35 **18 Claims**



1. In a data network system, a load control system having plural controllers which transmit signals to sub-buses with a transmission format common for all the controllers wherein at least one sub-system is connected through a bus, to control loads in said sub-system comprising:

plural sub-buses wherein at least one of said controllers is connected,

a main-bus for commonly connecting said plural sub-buses, said main bus and said plural sub-buses together comprising said bus,

a system switching means including plural switching means provided in respective ones of said plural sub-buses for connecting said each sub-bus to said main bus or disconnecting said each sub-bus from said main-bus.

bus watch means which has a detecting circuit which receives at least a signal from said sub-buses for discriminating the condition of said sub-buses therefrom and drives a respective one of said switching means responsive to the condition of said sub-buses, a transmitting circuit for transmitting an abnormal detecting signal from said detecting circuit to said main-bus, and a control circuit for controlling operation of said transmitting circuit and detecting means which detects an abnormal signal by detecting format difference between said abnormal signal and normal signal, for operating said switching means in a manner to disconnect said sub-bus from said main-bus when an abnormal signal is detected on at least one of said sub-bus and said main-bus, and for connecting said sub-bus to said main-bus when a normal signal is detected on the said sub-bus and said main-bus,

a first controller having an interface circuit, wherein a sensor for said sub-system is connected to one of said sub-buses,

a second controller having an operation switch for loads on said sub-system,

a third controller having loads, said second controller and said third controller being connected to another one of said sub-buses, and

said loads of said sub-system being retained operational even when in said sub-bus connected to said first controller is disconnected from said main-bus.

4,963,764

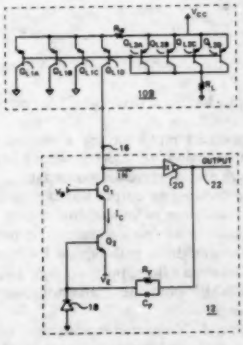
LOW NOISE CURRENT MIRROR ACTIVE LOAD CIRCUIT

Ronald Quan, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 47,694, May 8, 1987, abandoned. This application Mar. 23, 1989, Ser. No. 330,953

Int. Cl.[5] G05F *3/16*; H03K *3/01*

U.S. Cl. 307—270 **4 Claims**



1. A low noise integrated active load circuit in a current mirror configuration, with noise introduced into the output current by transistors in the bias side of the circuit attenuated, comprising:

(a) a voltage supply terminal;

(b) a ground potential terminal;

(c) an output terminal connected to an external circuit;

(d) a bias resistor having a first resistor terminal and a second resistor terminal said first resistor terminal connected to said ground potential terminal;

(e) a first output transistor having a first collector, a first base and a first emitter, said first emitter coupled to said voltage supply terminal and said first collector coupled to said output terminal, said first transistor being a PNP bipolar transistor; and

(f) a plurality of n bias transistors each having a second collector, a second base and a second emitter, each of said second emitters coupled to said voltage supply terminal, each of said second bases coupled to said first base and to said second resistor terminal, and each of said second collectors coupled to said second resistor terminal, said n bias transistors each being a PNP bipolar transistor;

(g) a third transistor having a third collector, a third base and a third emitter, said third transistor being a PNP transistor, said third emitter coupled to said first emitter, said third base coupled to said first base and said third collector coupled directly to said ground potential terminal;

(h) said output transistor having an output current determined by 1/n times the current through the bias resistor, and

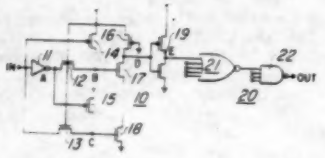
(i) each of said n bias transistors contributing to the noise in the current through the bias resistor, to produce a net noise component in the current through the resistor less than n times the noise contribution of one of the n bias transistors, whereby the noise in the output current contributed by the plurality of bias transistors is less than the noise a single bias transistor would contribute.

4,963,765

HIGH SPEED CMOS TRANSITION DETECTOR CIRCUIT

Shailesh R. Kadakia, Stafford, and David D. Wilmoth, Sugar Land, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 3, 1989, Ser. No. 376,920
Int. Cl.[5] H03K *19/094, 5/12*
U.S. Cl. 307—443 **27 Claims**



1. A circuit for detecting transitions in voltage, the circuit comprising:

at least one input having a first signal corresponding to said transitions in voltage;

at least one inverted input having a second signal corresponding to inversions of said transitions in voltage;

a supply voltage and a reference potential;

an output for providing an output voltage upon detection of one of said transitions or of said inversions;

a P-channel transistor having a source-drain path and having a gate, said source-drain path of said P-channel transistor connected between said supply voltage and said output, said gate of said P-channnel transistor connected to said reference potential;

a first and second N-channel transistors, each having a source-drain path and having a gate, said source-drain paths of said first and second N-channel transistors connected in series between said output and said reference potential;

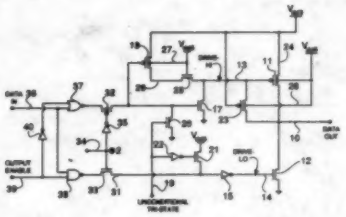
first and second N-channel leaker devices, each having a source-drain path and having a gate, said source-drain path of said first N-channel leaker device connected between a said inverted input and said gate of said first N-channel transistor, said gate of said first N-channel leaker device connected to said supply voltage, said source-drain path of said second N-channel leaker device connected between a said input and said gate of said second N-channel transistor, said gate of said second N-channel leaker device connected to said supply voltage.

4,963,766

LOW-VOLTAGE CMOS OUTPUT BUFFER

James R. Lundberg, Hubbardston, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 28, 1989, Ser. No. 372,670
Int. Cl.[5] H03K *19/094, 19/20, 17/687, 19/003*
U.S. Cl. 307—451 **20 Claims**



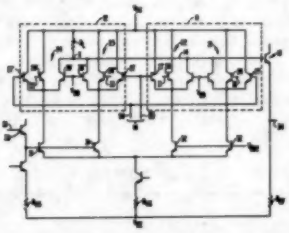
17. A circuit comprising: an output node; a pull-up transistor having a gate and having a source-to-drain path connecting said output node to a source of voltage of a given value; logic means driving said gate with logic voltage; means connected between said gate and said output node to allow said gate to follow the voltage of said output node to a voltage above said given value to thereby prevent said pull-up transistor from turning on to sink current into said source; and means to prevent a PN junction of said source-to-drain path from becoming forward biased by said voltage above said given value.

4,963,767

TWO-LEVEL ECL MULTIPLEXER WITHOUT EMITTER DOTTING

Nguyen X. Sinh, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 25, 1988, Ser. No. 236,567
Int. Cl.[5] H03K *19/086, 17/16*
U.S. Cl. 307—455 **6 Claims**



1. A 4:1 multiplexer circuit comprising:

first and second 2:1 ECL multiplexer circuits receiving first and second pairs of input lines, respectively, at a first voltage level, wherein said 2:1 multiplexer circuits share a common output stage and have respective outputs connected together prior to said output stage;

a differential Select line operable at said first voltage level and having first and second complementary sides, wherein said first side is connected in logic "OR" arrangement with a first input line of each said pair and said second side is connected in logic "OR" arrangement with the second input line of each said pair, whereby said differential Select line operates to select one of said input lines for each of said 2:1 multiplexer circuits; and

a second Select line operable at a second voltage level and operatively associated with said first and second 2:1 multiplexer circuits to select one of said circuits, whereby a

signal on one of said selected input lines is provided to said common output stage.

4,963,768

FLEXIBLE, PROGRAMMABLE CELL ARRAY INTERCONNECTED BY A PROGRAMMABLE SWITCH MATRIX

Om P. Agrawal, San Jose, Calif.; Kerry A. Ilgenstein, Austin, Tex.; Michael J. Wright, Santa Clara, Calif.; Jerry D. Mo-ench, Austin, Tex., and Arthur H. Khu, San Mateo, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 178,707, Apr. 7, 1988, which is a continuation of Ser. No. 717,640, Mar. 29, 1985, Pat. No. 4,742,252. This application Sep. 12, 1988, Ser. No. 243,574

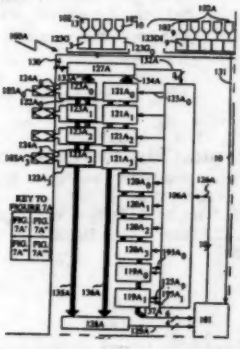
Int. Cl.[5] H03K *19/177*

U.S. Cl. 307—465 **19 Claims**

1. A semiconductor integrated circuit comprising:

first logic circuit means, having a first multiplicity of input lines and a first multiplicity of output lines, for providing a first output signal on at least one of said first multiplicity of output lines in response to selected input signals on said first multiplicity of input lines, said first output signal being a logic function of the selected input signals on said first multiplicity of input lines;

second logic circuit means, having a second multiplicity of input lines and a second multiplicity of output lines, for providing a second output signal on at least one of said second multiplicity of output lines in response to selected input signals on said second multiplicity of input lines, said second output signal being a logic function of selected input signals on said second multiplicity of input lines;



programmable switch means for selectively interconnecting said first logic circuit means and said second logic circuit means wherein said programmable switch means selectively couples at least one output line from said first multiplicity of output lines to at least one of said first multiplicity of input lines or one of said second multiplicity of input lines, and further wherein said programmable switch means selectively couples at least one output line from said second multiplicity of output lines to at least one of said first multiplicity of input lines or one of said second multiplicity of input lines.

4,963,769

CIRCUIT FOR SELECTIVE POWER-DOWN OF UNUSED CIRCUITRY

W. Randolph Hiltpold, and Shiva P. Gowni, both of Starkville, Miss., assignors to Cypress Semiconductor, San Jose, Calif.

Filed May 8, 1989, Ser. No. 348,612

Int. Cl.[5] H03K *19/173, 19/094*

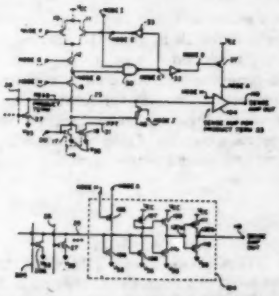
U.S. Cl. 307—465 **18 Claims**

9. A CMOS power reduction circuit for the reduction of power consumption of a sense amplifier for an unused product term of a programmable logic array, said CMOS power reduction circuit comprising:

a nonvolatile programmable storage means having a first current path between a first terminal and a second terminal, said second terminal being coupled to a first reference voltage, said nonvolatile programmable storage means having a floating gate to store charges, said floating gate having one of two possible states being charged and uncharged;

a first and a second MOS field effect transistor, said first MOS field effect transistor having a first control electrode coupled to receive a power-up signal which is momentarily pulsed when power is first supplied to said CMOS power reduction circuit, said first MOS filed effect transistor having a second current path, said second MOS filed effect transistor having a second control electrode and a third current path, said second current path and said third current path being coupled in parallel between a second reference voltage and a third terminal;

a third MOS field effect transistor having a third control electrode coupled to receive a third reference voltage and having a fourth current path having a one end and an other end, said one end of said fourth current path being



coupled to said third terminal and said other end of said fourth current path coupled to said first terminal of said nonvolatile programmable storage means;

a logic gate having a first and a second input and a first output, said first input being coupled to said third terminal and said second input being coupled to receive a signal causing power to be provided to said sense amplifier regardless of the state of said floating gate;

a first inverter and a second inverter, said first inverter having a third input and a second output, said second inverter having a fourth input and a third output, said third input and said fourth input being coupled to said first output of said logic gate, said third output being coupled to said second control electrode;

a control transistor device having a fourth control electrode coupled to said second output of said first inverter and having a fifth current path being coupled between a power supply and said sense amplifier to selectively provide said power supply to said sense amplifier in response to a signal on said fourth control electrode, said signal on said fourth control electrode having one of two stable signal states after said power-up signal is momentarily pulsed being determined by the state of said floating gate.

4,963,770

PROGRAMMABLE LOGIC DEVICE

Hisaya Keida, Chiba, Japan, assignor to Kawasaki Steel Corporation, Japan

Continuation of Ser. No. 270,800, Nov. 14, 1988, abandoned. This application Jan. 24, 1990, Ser. No. 469,728

Claims priority, application Japan, Nov. 20, 1987, 62-293721; Jun. 30, 1988, 63-163389

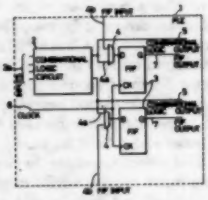
Int. Cl.[5] H07K *19/177*

U.S. Cl. 307—465 **10 Claims**

1. A programmable logic device comprising a plurality of programmable logic elements which can be connected to each other, wherein:

each said programmable logic element has a programmable combinational logic circuit and a respective plurality of flip-flop circuits;

each flip-flop circuit of said respective plurality of flip-flop circuits is independently provided with a first input terminal for receiving an output from said combinational logic circuit, a second input terminal for receiving an output from another programmable logic element and a switching section for selecting one of the outputs received by said input terminals to input the selected output into the flip-flop circuit; and



each said programmable logic element is further provided with first output terminals for outputting an output of said combinational logic circuit, and second output terminals for outputting outputs of said respective flip-flop circuits, said first and second output terminals being independent of each other.

4,963,771

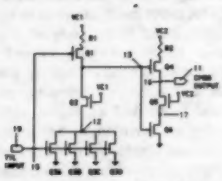
TTL/CMOS LEVEL TRANSLATOR

Shuen-Chin Chang, San Jose, Calif., assignor to Samsung Semiconductor, San Jose, Calif.

Filed Sep. 12, 1989, Ser. No. 406,721

Int. Cl.[5] H03K *17/16, 19/0175*

U.S. Cl. 307—475 **11 Claims**



1. An electrical circuit for translating transistor-transistor logic (TTL) input voltage levels to complementary metal oxide semiconductor (CMOS) voltage levels comprising:

an input stage comprising a first complementary pair of drain coupled first and second transistors of first and second conductivity type, respectively, said first transistor source coupled to a first supply voltage, said second transistor gate coupled to said first supply voltage;

a third transistor of said second conductivity type, said third transistor gate coupled to said TTL input, source coupled to ground and drain coupled to the source of said second transistor;

said TTL input coupled to the gate of said first transistor;

an output stage comprising a second complementary pair of drain coupled fourth and fifth transistors of said first and second conductivity type, respectively, said fourth transistor source coupled to a second supply voltage, said fifth transistor gate coupled to said second supply voltage;

a sixth transistor of said second conductivity type, said sixth transistor gate coupled to said drain of said first transistor, source coupled to ground, and drain coupled to the source of said fifth transistor; and

said CMOS voltage provided at the drain of said fifth transistor.

4,963,772

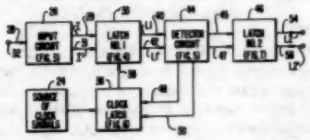
METASTABLE-IMMUNE FLIP-FLOP ARRANGEMENT

Charles E. Dike, Pleasant Grove, Utah, assignor to North American Philips Corp., Signetics Div., Sunnyvale, Calif.

Filed Feb. 7, 1989, Ser. No. 307,861

Int. Cl.[5] H03K *3/27*

U.S. Cl. 307—480 **13 Claims**



1. A flip-flop arrangement comprising

first and second latches,

means for applying input data signals to said first latch,

means settable by input clock signals for applying enabling clock signals to said first latch,

and means coupled between said first and second latches and responsive to a signal from said first latch that is at least equal to a specified value for applying a switching signal to said second latch and a reset signal to said means for applying enabling clock signals.

4,963,773

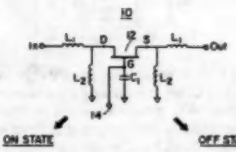
LOW PASS/HIGH PASS FILTER PHASE SHIFTER

Yalcin Ayasli, Lexington, Mass., assignor to Hittite Microwave Corporation, Woburn, Mass.

Filed Jul. 18, 1988, Ser. No. 220,737

Int. Cl.[5] H01C *1/082*; H03K *3/26, 5/13*

U.S. Cl. 307—511 **5 Claims**



1. A compact, low pass/high pass filter phase shifter circuit comprising:

a semiconductor switch having a control electrode and first and second load electrodes;

a first inductance connected in series with one load electrode, and a second inductance connected in series with the other load electrode;

a third inductance connected in parallel with one load electrode to ground and a fourth inductance connected in parallel with the other load electrode to ground;

a capacitance connected in series between said control electrode and ground; and

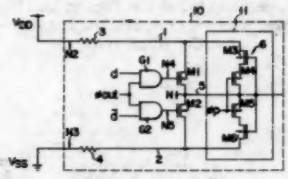
means for applying a control signal to said control electrode for switching said semiconductor switch between a first state in which it operates as a low pass filter and a second state in which it operates as a high pass filter to introduce a phase shift in a propagated signal.

4,963,774

INTERMEDIATE POTENTIAL SETTING CIRCUIT

Masumi Masuda, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 2, 1989, Ser. No. 305,220
Claims priority, application Japan, Feb. 5, 1988, 63-25156
Int. Cl.[5] H03K 17/687, 19/094, 17/16; H03L 5/00
U.S. Cl. 307—585 17 Claims



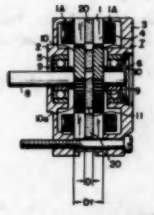
1. An intermediate potential setting circuit comprising:
first and second power source lines;
an intermediate potential-setting line;
a transistor pair including a first transistor and a second transistor, each of said first and second transistors having a first terminal connected to said intermediate potential-setting line, a second terminal, and a gate terminal to which a control signal is supplied; and
a complementary transistor pair including a third transistor and a fourth transistor, said third transistor having a first terminal connected to said first power source line, a second terminal connected to the second terminal of said first transistor, and a gate terminal connected to said intermediate potential-setting line, said fourth transistor having a first terminal connected to the second terminal of said second transistor, a second terminal connected to said second power source line, and a gate terminal connected to said intermediate potential-setting line.

4,963,775

STEPPING MOTOR

Hidetoshi Mori, Tokyo, Japan, assignor to Tamagawa Seiki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 332,298
Claims priority, application Japan, Dec. 1, 1988, 63-302181
Int. Cl.[5] H02K 37/00
U.S. Cl. 310—49 R 8 Claims



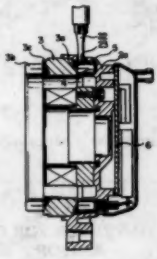
1. A stepping motor comprising a stator provided with stator coils mounted on stator yokes with the stator sandwiched between covers, a rotor shaft mounted on said covers for rotation and carrying a rotor composed of rotor yokes and rotor magnets spaced from said stator by a gap, said rotor being rotated stepwise through a predetermined angle when drive signals are supplied to said stator coils, wherein said stator has stator magnets provided at an axially central position between two parts of said stator which stator magnets are polarized in the axial direction of the stator for cooperation with said rotor magnets, and wherein the magnetic flux density in said gap between the stator and the rotor is increased by said stator magnets.

4,963,776

VEHICULAR A.C. GENERATOR HAVING IMPROVED COOLING STRUCTURE

Yutaka Kitamura, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1989, Ser. No. 305,042
Claims priority, application Japan, Feb. 3, 1988, 63-24303
Int. Cl.[5] H02K 9/22
U.S. Cl. 310—64 11 Claims



1. A vehicular a.c. generator comprising:
a housing having a cooling surface;
a rotor rotatably supported within said housing;
a stator supported by said housing to be disposed around said rotor, said stator having a coil end substantially spaced apart from said housing to define a clearance therebetween; and
a thermally conductive filling material filled in said clearance between said stator coil end and said housing for efficiently conducting heat generated in said stator coil end to said housing;
said housing having at least one filler passage means communicating said clearance to the exterior of said housing for introducing therethrough said filling material into said clearance and for completely filling said clearance from said exterior once said filling material has been filled in said clearance.

4,963,777

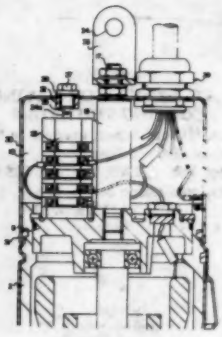
SUBMERSIBLE ELECTROMOTOR WITH INTERNAL VOLTAGE SELECTOR SWITCH

Albert Blum, Lohmar, Fed. Rep. of Germany, assignor to ABS Pumpen AG, Scheiderhohe, Fed. Rep. of Germany

Filed Sep. 7, 1989, Ser. No. 403,882
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1989, 3902326
Int. Cl.[5] H02K 5/10; F04B 49/00
U.S. Cl. 310—68 A 10 Claims

1. A submersible three-phase motor having first and second operating voltages, the motor comprising a fluid-tight housing, a shaft mounted therein, the connecting end of which is brought out on one side in a leakproof fashion from the housing, a rotor seated on the shaft, and a stator fixed relative to the housing, characterized in that there is provided in the interior of the housing (2) a voltage selector switch (23) for changing between the first and second operating voltages, in that there is provided in the region of the voltage selector switch (23) a

detachable housing part which, in the detached state, clears a housing opening, and in that the actuating element of the



voltage selector switch (23) is accessible through the housing opening.

4,963,778

FREQUENCY CONVERTER FOR CONTROLLING A MOTOR

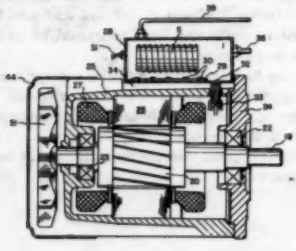
Niels D. Jensen, Kaj Kruse, and Peder Jensen, all of Bjerringbro, Denmark, assignors to Grundfos International A/S, Denmark

Continuation of Ser. No. 315,201, Feb. 23, 1989, abandoned, which is a continuation of Ser. No. 131,713, Dec. 11, 1987, abandoned. This application Feb. 22, 1990, Ser. No. 485,782

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642724

Int. Cl.[5] H02K *11/00*

U.S. Cl. 310—68 D **2 Claims**



1. In an electric motor wherein the operational parameters comprising rpm and torque are varied by means of a static frequency converter, especially an electric motor in combination with a device driven thereby, such as a pump, a fan, a machine tool or a power tool, said motor having a shaft and a ventilator attached to said shaft for cooling the motor windings, wherein the frequency converter, which is miniaturized by the use of highly integrated circuitry, is joined mechanically to the motor to form a constructional unit and wherein the waste heat of the frequency converter can be dissipated by cooling, the improvement wherein a ventilator housing is mounted on said motor housing, said ventilator being arranged in a space between said ventilator housing and motor housing, said ventilator housing and said motor housing having respective portions which form a channel means for guiding the cooling air stream generated by rotation of said ventilator, and wherein a terminal box of the motor is attached to the motor housing of the motor with free spacing so that a radially external free space is formed between the terminal box and the motor housing for carrying the cooling air stream generated by the ventilator and guided by said channel means, said terminal box receiving at least part of said frequency converter.

4,963,779

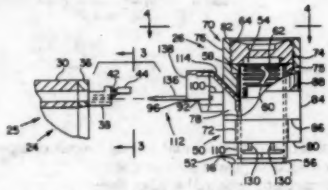
BRUSH HOLDER FOR AN ELECTRIC MOTOR

Lynn E. Lentino, Westminster, and Terry L. Turner, Finksburg, both of Md., assignors to Black & Decker, Inc., Newark, Del.

Filed May 15, 1989, Ser. No. 351,996

Int. Cl.[5] H02K *11/00*

U.S. Cl. 310—71 **26 Claims**



1. A brush holder subassembly for an electric motor, the motor having an axis of rotation and including a motor housing and a plurality of motor elements including at least one field winding and a switch, comprising:

an insulator including a body having a through bore and a support element disposed externally of the body; and

a brush holder of conductive material, including a sleeve portion for slidably receiving a brush, housed in fixed position in the bore of the insulator body, and an integral elongated terminal portion fixedly connected to the sleeve portion, disposed externally of the insulator body and extending perpendicular to the longitudinal axis of the insulator body bore and including a free connecting end for electrical connection to one of the motor elements, and an opposite support end for engaging the support element of the insulator so as to stabilize the disposition of the terminal portion relative to the sleeve portion.

4,963,780

WATER DRIVEN GENERATOR FOR SANITARY DOMESTIC INSTALLATION

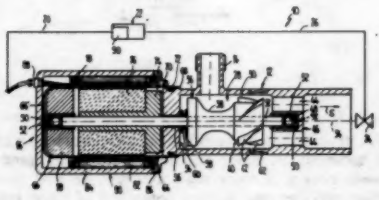
Ferdinand F. Hochstrasser, Auenstein, Switzerland, assignor to KWC AG, Switzerland

Filed Sep. 25, 1989, Ser. No. 412,096

Claims priority, application Switzerland, Sep. 27, 1988, 03580/88

Int. Cl.[5] H02K *7/18*; F01D *15/10*

U.S. Cl. 310—104 **21 Claims**



11. A water fitting for use in domestic sanitary installation comprising: a flow duct, a turbine wheel located in the flow duct so as to be subjected to water flowing through the duct, an electrical generator driven by the turbine wheel having a stator and a rotor including a permanent magnet arrangement

for the excitation of the generator, a gap separating the rotor and stator, and a unitary beaker shaped seal element made from a non-magnetic metal and fixed in the gap between the stator and the rotor, the seal element enclosing the rotor, sealing the flow duct off from the stator, and including a bearing element on an end face thereof rotatably supporting the rotor, the stator being fixed to an outer surface of the beaker shaped seal element to surround the rotor.

4,963,781

ULTRASONIC MOTOR

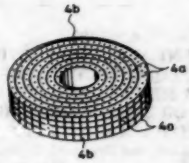
Masanori Sumihara, Moriguchi; Yoshinobu Imasaka, Higashi-osaka, and Hiroshi Yoneno, Shiki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 22, 1988, Ser. No. 274,967

Claims priority, application Japan, Nov. 26, 1987, 62-298951; Nov. 26, 1987, 62-298952; Nov. 26, 1987, 62-298953; Mar. 15, 1988, 63-60996

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—323 **4 Claims**



1. An ultrasonic motor comprising:

a piezoelectric element;

a vibrating stator provided on said piezoelectric element for generating travelling waves;

a driven member; and

a friction member disposed between said vibrating stator and said driven member, said friction member comprising reinforcing fibers arranged in substantially the same direction as a moving direction of said driven member.

4,963,782

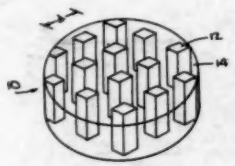
MULTIFREQUENCY COMPOSITE ULTRASONIC TRANSDUCER SYSTEM

Tuan Bui; Helen L. W. Chan, both of Carlingford, and Joe Unsworth, Dundas, all of Australia, assignors to Ausonics Pty. Ltd., Lane Cove, Australia

Filed Oct. 3, 1988, Ser. No. 252,789

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—358 **26 Claims**



1. An ultrasonic transducer system comprising an assembly including a plurality of rigid piezoelectric elements in a relatively less rigid matrix, said piezoelectric elements being arranged in said matrix in a 1-3 structure, said piezoelectric elements having a width-to-thickness ratio of between substantially 1.6 and substantially 2.5.

4,963,783

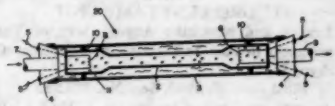
ELECTRODED PHOTOCHEMICAL LAMPS FOR PHOTOCHEMICAL MERCURY SEPARATION

Mark W. Grossman, Belmont, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Dec. 19, 1988, Ser. No. 286,313

Int. Cl.[5] H01J *61/20, 61/34;* B01D *5/00, 59/38*

U.S. Cl. 313—22 **11 Claims**



1. An electroded, mercury photochemical lamp for the isotopic enrichment of mercury, said lamp capable of emitting radiation at a desired spectral linewidth, comprising:

a. a sealed, elongated, longitudinal envelope containing a vapor phase which comprises mercury vapor and an inert gas;

b. at least two electrodes positioned and sealed at each longitudinal end of the envelope in a manner which allows each electrode to pass through a seal;

c. an outer, elongated, longitudinally cylindrical jacket substantially centered around at least one section of the envelope, thereby defining a region for containing a heat transfer medium useful for controlling the temperature of the inner envelope.

4,963,784

SPARK PLUG HAVING COMBINED SURFACE AND AIR GAPS

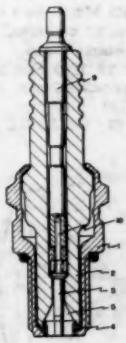
Werner Niessner, Steinheim, Fed. Rep. of Germany, assignor to Beru Reprecht GmbH & Co. KB, Ludwigsburg, Fed. Rep. of Germany

Filed May 18, 1989, Ser. No. 353,774

Claims priority, application Fed. Rep. of Germany, May 18, 1988, 3816968

Int. Cl.[5] H01T *13/52*

U.S. Cl. 313—131 R **20 Claims**



1. A spark of the type having combined surface discharge and air discharge gaps, wherein said spark plug comprises a spark plug body, a central electrode, an insulator surrounding the central electrode, and a ground electrode, wherein the ground electrode surrounds the insulator together with the spark plug body; wherein the insulator has an end portion at a radial distance from the central electrode which forms a discharge chamber into which the central electrode extends; wherein said ground electrode surrounds the end portion of

the insulator and has a projection extending into the discharge chamber; and wherein the central electrode extends axially through the discharge chamber as far as an end portion of the spark plug body as a means for enabling an air and surface spark to be produced as well as air gap and pure surface discharges.

4,963,785

FLUORESCENT LAMP UNIT

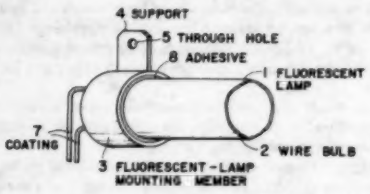
Masami Takagi, and Masahiko Aoyagi, both of Yokohama, Japan, assignors to Toshiba Lighting & Technology Corporation, Tokyo, Japan

Filed Jun. 30, 1989, Ser. No. 373,582

Claims priority, application Japan, Jul. 6, 1988, 63-166820

Int. Cl.[5] H01J *5/48*

U.S. Cl. 313—318 **6 Claims**



1. A fluorescent lamp unit comprising:

a fluorescent lamp;

fluorescent-lamp mounting members mounted at end portions of the fluorescent lamp, for fixing said fluorescent lamp to other members; and

elastic means interposed between said fluorescent-lamp mounting members and said end portions of the fluorescent lamp, and mounted so that said fluorescent-lamp mounting members can rotate by an angle not less than 1° relative to said fluorescent lamp.

4,963,786

METHOD AND APPARATUS FOR SUPPORTING A SHADOW MASK

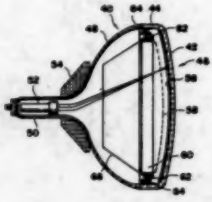
Kiyoshi Tokita; Takashi Murai, both of Fukaya, and Takeshi Fujiwara, Kumagaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 19, 1989, Ser. No. 298,973

Claims priority, application Japan, Jan. 22, 1988, 63-10797; Aug. 30, 1988, 63-215740

Int. Cl.[5] H01J *9/18, 29/07*

U.S. Cl. 313—406 **12 Claims**



1. A color cathode ray tube comprising:

a vacuum envelope defined by a central axis and including a panel section, a funnel section and a neck section, said panel section having a substantially rectangular faceplate with an inner surface, and a skirt extending from a peripheral edge of said faceplate, said funnel section being contiguous to said skirt of said panel section, and said neck section being formed in a substantially cylindrical shape and contiguous with said funnel section;

a phosphor screen formed on said inner surface of said faceplate;

a shadow mask arranged in said panel section and opposite said phosphor screen on said faceplate;

a mask frame welded to a periphery of said shadow mask;

a plurality of stud pins provided on said panel, for supporting said shadow mask;

a plurality of first elastic supporting means for supporting said shadow mask in said panel section, said first supporting means including a metal plate and welded to said mask frame; and

at least one second elastic supporting means for supporting said shadow mask in said panel section, said second supporting means having a metal plate and a washer,

wherein an area of a polygon formed on a plane lying at right angles with the tube axis and having apices corresponding to said first elastic supporting means is at least about ½ the area of a quadrangle formed by projecting said shadow mask onto a plane lying at right angles with the tube axis.

4,963,787

LUMINESCENT ALKALINE EARTH METAL ORTHOSILICATE, LUMINESCENT SCREEN PROVIDED WITH SUCH A SILICATE AND LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP PROVIDED WITH SUCH A SCREEN

Johannus G. Verlijsdonk, and Bruno M. J. Smets, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 24, 1990, Ser. No. 469,127

Claims priority, application Netherlands, Feb. 15, 1989, 8900364

Int. Cl.[5] C09K *11/59*

U.S. Cl. 313—486 **4 Claims**

1. A luminescent alkaline earth metal orthosilicate activated by a rare earth metal, characterized in that the silicate is activated by Pr^{3+} and is defined by the formula $M_{2-3/2x-\frac{1}{2}y}Pr_xM'_ySiO_4$ in which M is at least one of the elements Ca and Sr of which up to 50 mol % is replaceable by Ba and/or of which up to 20 mol % is replaceable by Mg, in which M' is at least one of the elements Li, Na and K and in which $0.004 \leq x \leq 0.10$ and $0 \leq y \leq 0.10$.

4,963,788

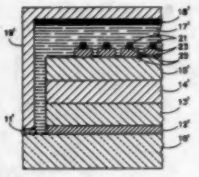
THIN FILM ELECTROLUMINESCENT DISPLAY WITH IMPROVED CONTRAST

Christopher N. King, and Richard E. Coovert, both of Portland, Oreg., assignors to Planar Systems, Inc., Beaverton, Oreg.

Filed Jul. 14, 1988, Ser. No. 218,848

Int. Cl.[5] H05B *33/04, 33/06, 33/28*

U.S. Cl. 313—503 **13 Claims**



1. In a TFEL device for providing an optical display, a substrate supporting a laminar thin film re including a set of transparent front electrodes and a phosphor layer sandwiched between front and rear insulating layers, the improvement comprising:

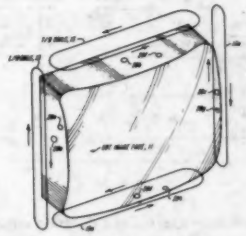
(a) a set of at least semitransparent rear electrodes deposited on said rear insulating layer;
(b) a set of conductive bus bars arranged colinearly and in contact with each electrode in said set of transparent rear electrodes; and
(c) enclosure means sealed against said substrate for defining a cavity enclosing said laminar thin-film structure, said cavity including within it an optically absorbent material disposed behind the rear electrode set for absorbing ambient light to improve the contrast of the optical display.

4,963,789

METHOD AND APPARATUS FOR DYNAMIC MAGNETIC FIELD NEUTRALIZATION

Frederick T. Buhler, Providence, R.I., assignor to Conrac SCD, Inc., Durste, Calif.

Filed May 1, 1989, Ser. No. 345,575
Int. Cl.[5] H01J *29/06*
U.S. Cl. 315—8 **12 Claims**



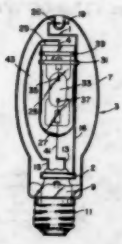
1. A method for nulling the magnetic field within a specified volume in the presence of an external ambient magnetic field comprising the steps of:
generating magnetic fields at a plurality of locations around said specified volume;
sensing the value of the magnetic field at a plurality of locations around said specific volume;
employing the sensed value of said magnetic field on a substantially continuous basis to control the value of said generated magnetic fields to null the value of the magnetic field within said specific volume.

4,963,790

LOW WATTAGE METAL HALIDE DISCHARGE LAMP

Robert S. White, Beverly, and James C. Morris, Wakefield, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Dec. 27, 1985, Ser. No. 814,140
Int. Cl.[5] H01J *61/34*
U.S. Cl. 313—25 **5 Claims**



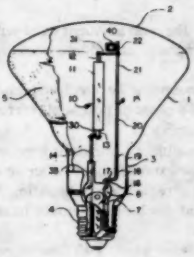
1. A metal halide discharge lamp comprising:
an evacuated glass envelope;
a stem member disposed within said envelope having a pair of electrical conductors sealed therein and passing therethrough;
a heat loss reducing member disposed within said envelope and having an outer metal band surrounding and affixed thereto;
an arc tube disposed within said heat loss reducing member containing a chemical fill including a halide of sodium and having two electrodes, one electrode being at each end of said arc tube with an outer strap member adjacent one of said electrodes;
means for electrically coupling each of said electrodes to each of said electrical conductors disposed within said envelope; and
a support structure, said support structure being affixed to a portion of said envelope and affixed to said stem member by a strap member, said support structure supporting said arc tube by said outer strap member and supporting said heat loss reducing member within said envelope by said outer metal band, said support structure not being electrically connected to the arc tube electrodes or the electrical conductors of the lamp.

4,963,791

HIGH PRESSURE SODIUM DISCHARGE TUBE SUPPOKT STRUCTURE

Ray Gibson, III, and Jagannathan Ravi, both of Bath, N.Y., assignors to North American Philips Corp., New York, N.Y.

Continuation of Ser. No. 212,818, Jun. 29, 1988, abandoned.
This application Sep. 28, 1989, Ser. No. 415,397
Int. Cl.[5] H01J *61/34, 61/36*
U.S. Cl. 313—25 **8 Claims**



1. In a high pressure sodium discharge reflector lamp, comprising a sealed outer lamp envelope having a reentrant stem and an axis of symmetry through said stem and defining a lamp centerline, a high pressure sodium discharge device comprising an elongate body having a pair of terminals each extending from a respective end of said elongate body for receiving thereacross an electrical potential to energize said discharge device to emit light, and mounting means for mounting said discharge device within said sealed envelope on the lamp centerline and for defining a conductive circuit to said pair of terminals to permit energization of said discharge device, the improvement comprising:
said sealed outer envelope containing a quantity of rare gas such that the pressure of said rare gas is approximately one atmosphere when the lamp is at its operating temperature; and
said mounting means comprising a pair of upstanding support conductors extending from said stem, one shorter and one longer than the other, and extending generally parallel to said lamp axis, transverse conductive links connected between said support conductors and said discharge device terminals for mounting said discharge device on the lamp centerline and establishing a conductive path for energizing said discharge device, and means for

increasing the electrical breakdown voltage between said pair of support conductors to avoid electrical breakdown through said rare gas in said outer envelope when said discharge device is energized during lamp operation.

4,963,792

SELF CONTAINED GAS DISCHARGE DEVICE

William P. Parker, Box 909, Waitsfield, Vt. 05673-0909

Continuation-in-part of Ser. No. 21,472, Mar. 4, 1987, Pat. No. 4,754,199. This application Jun. 27, 1988, Ser. No. 212,220

The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.

Int. Cl.[5] H05B *41/26*; H01J *61/12*

U.S. Cl. 315—58 15 Claims

1. A gas discharge apparatus, comprising:

A. a discharge chamber including a dielectric wall member enclosing a discharge region containing an ionizable gas, said wall member having a dome portion, and a base portion,

B. an electrode disposed adjacent to or within said discharge region and opposite said dome portion of said discharge chamber,

C. means for coupling ac electrical energy between said electrode and a point of potential reference external to the discharge chamber,

D. field shield including preventing means for substantially preventing the establishment of an ac electric field from said discharge region and extending through said base portion of said discharge chamber to said point of potential reference,

wherein said ionizable gas in said discharge chamber includes a gas mixture at a pressure in the approximate range 100–810 torr.

4,963,793

DELAYED RESPONSE TOUCH SWITCH CONTROLLER

John F. DePaoli, San Diego, Calif., assignor to Westek Associates, San Diego, Calif.

Continuation-in-part of Ser. No. 148,767, Jan. 26, 1988. This application Mar. 8, 1988, Ser. No. 165,591

The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.

Int. Cl.[5] H01J *7/66*; H05B *37/02*, *41/04*

U.S. Cl. 315—74 20 Claims

1. A system adapted for coupling between an electrical appliance and an electrical power source for controlling the level of power applied to said appliance, comprising:

switch means, responsive to a user input indicative of a user requested level of operation of said appliance, for providing a corresponding switch signal, said switch means comprising:

a flexible membrane;

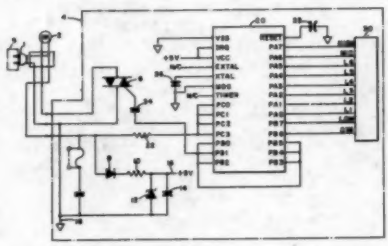
a plurality of spaced apart electrical pattern conductors disposed in a continuous single column array upon a first surface of said membrane;

a plurality of electrically conductive level leads disposed upon said membrane, each level lead coupled to a respective other one of said conductors in each respective region of said conductor array;

a rigid member having a flat surface, a recessed portion of said rigid member surface aligned and facing said conductor array; and

a fixed conductor formed in said recessed portion, said membrane being attached to said rigid member with said conductor array suspended over said recessed portion so that certain ones of said pattern conductors come in contact with said fixed conductor when pressure is applied to a second surface of said member above said recessed portion;

control means for receiving said switch signal and responsive thereto for generating a control signal during each of a continuous sequence of equal time intervals, said control



signal in each time interval of a duration corresponding to said user requested level of operation of said appliance;

power conditioning means for receiving electrical power from said power source and for receiving said control signal, said power conditioning means responsive to said control signal for coupling electrical power to said appliance; and

said switch means further responsive to a user request for delayed turn-off of said appliance for providing a corresponding delayed-off signal, said control means responsive to said delayed-off signal for generating said control signal of a reduced duration, relative to a current control signal duration, during each time interval for a predetermined time period after which said control means inhibits generation of said control signal.

4,963,794

VEHICLE CORNERING HEADLAMP SYSTEM

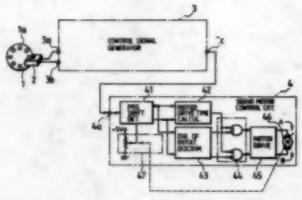
Hiromi Shibata; Kazuki Takahashi; Keiichi Tajima; Takashi Kurita; Kiyoshi Wada, and Kiyoshi Yamashita, all of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 241,721

Claims priority, application Japan, Sep. 8, 1987, 62-223068

Int. Cl.[5] B60Q *1/12*

U.S. Cl. 315—81 13 Claims



1. In a vehicle cornering headlamp system of the type in

which the direction of illumination of headlamp means is changed in association with a steering wheel turning operation, the improvement comprising: characteristic varying means for making a gradient of a variation characteristic of said direction of illumination with respect to a steering angle larger in a case where a steering wheel is turned towards a straight-ahead steering position than in a case where said steering wheel is turned away from said straight-ahead steering position.

4,963,795

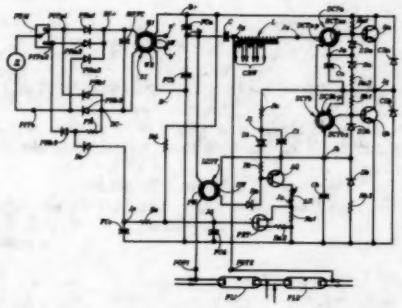
STEP-CONTROLLABLE ELECTRONIC BALLAST

Ole K. Nilssen, Caesar Drive, Barrington, Ill. 60010

Continuation-in-part of Ser. No. 300,579, Jan. 23, 1989. This application Mar. 2, 1989, Ser. No. 317,906

Int. Cl.[5] H05B *37/00, 39/00*; H02M *3/24, 7/538*

U.S. Cl. 315—205 **16 Claims**



1. An arrangement comprising:

a source of alternating supply voltage;

lamp means having lamp terminals; and

power supply means having a first, a second and a third power input terminal; the power supply means having output terminals connected with the lamp terminals and being operative to provide AC power to the lamp means in response to being provided with the supply voltage between the first and either the second or the third power input terminal; the AC power being associated with an AC voltage; the frequency of the AC voltage being substantially higher than that of the voltage normally present at an ordinary electric utility power line; the AC power having a magnitude that is substantially higher when the supply voltage is provided between the first and the second power input terminal as compared with a situation wherein the supply voltage is provided between the first and the third power input terminal.

4,963,796

HIGH-PRESSURE SODIUM VAPOR LAMP

Wolfgang Gottschling; Klaus Guenther, both of Berlin; Hans-Georg Kloss, Hohen-Neuendorf; Rainer Radtke, Berlin, and Felix Serick, Neuenhagen, all of Fed. Rep. of Germany, assignors to Kombinat VEB Narva, Berlin, Fed. Rep. of Germany

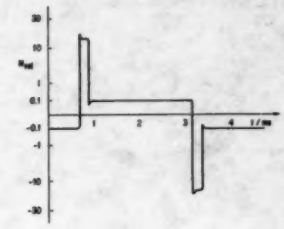
Filed Feb. 27, 1989, Ser. No. 316,386

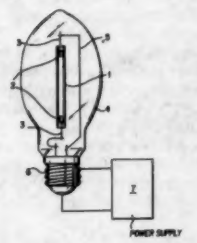
Claims priority, application German Democratic Rep., Mar. 25, 1988, 3140295

Int. Cl.[5] H05B *41/30*

U.S. Cl. 315—246 **16 Claims**

1. In a high-pressure sodium vapor lamp system comprised of a translucent heat-resistant arc tube filled with an arc medium, and a power supply connected to the arc lamp for supplying thereto pulses having a frequency of at least 100 Hz, the improvement wherein said arc medium comprised sodium with a mole fraction of $x_{Na} > 0.9$ as the chief arc medium, and said power supply comprises means for applying pulses to said lamp having a power that exceeds the total time average by at least





fivefold, with a time interval of nor more than 10 ms and a duty cycle τ of $0.01 < \tau < 0.1$ with alternating polarity.

4,963,797

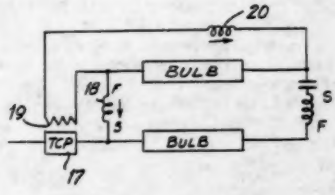
THERMAL PROTECTOR/RESISTOR COMBINATION

Robert Kulka, Livingston, and Dinesh Chandra, Wayne, both of N.J., assignors to Magnetek Unicersal Mfg. Corp., Paterson, N.J.

Filed May 17, 1989, Ser. No. 353,245

Int. Cl.[5] H05B *37/02*

U.S. Cl. 315—309 **9 Claims**



1. A ballast assembly having a first coil, a second coil and an auxiliary coil, a thermal circuit protector disposed adjacent the first coil, the protector having thermally responsive switch means integral therewith, the switch means connected between a power source and the coils, the ballast assembly further comprising:

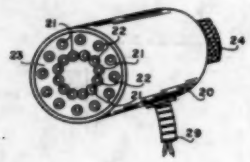
resistor means, mounted on the protector, for resisting current flow, the resistor means electrically connected in series with the starter coil such that current passes therethrough without heating the resistor means during a low current draw condition, with the resistor producing sufficient heat during a high current draw condition to actuate the switch means in the protector, thereby interrupting the power supply to the assembly.

4,963,798

SYNTHESIZED LIGHTING DEVICE

Kevin McDermott, 196 Phillips Dr., Hampstead, Md. 21074

Filed Feb. 21, 1989, Ser. No. 312,480
Int. Cl.[5] H05B 37/02, 37/00; F21V 23/00
U.S. Cl. 315—312 25 Claims



1. A lighting device, supplied with electrical power, for illumination and improved color perception by an observer of external surfaces, which comprises:

(a) a first subassembly comprising at least one lamp for emitting a first beam of photometric energy of a first spectral distribution and a first median wavelength which remains relatively stable over a given range of said power;

(b) a second subassembly comprising at least one lamp for emitting a second beam of photometric energy of a second spectral distribution with a second median wavelength which remains relatively stable over said given range of power and that differs from that of said first median wavelength;

(c) means to combine and project said first and second beams of photometric energy from said lighting device such that when the composite energies are used to illuminate an external surface said composite energies are perceived by said observer as a synthesized third spectral distribution with a median wavelength differing from both said first and said second median wavelengths; and

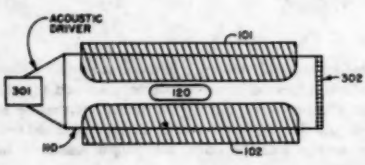
(d) means for an automatic diminishment of shifts of said median wavelength of said synthesized composite energies resulting from disproportionate changes in the photometric energies emitted by said first and second subassemblies initiated by changes in power consumed by said lighting device due to variations of said supply of electrical power by degradation and voluntary adjustments.

4,963,799

ACOUSTIC ENHANCEMENT OF MULTICHANNEL SPARK GAP

James P. O'Loughlin, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 16, 1989, Ser. No. 311,688
Int. Cl.[5] H01J 17/30
U.S. Cl. 315—345 6 Claims



1. A spark gap assembly comprising:

an enclosure which contains a gas medium;

a first and a second rail electrode which extend into said enclosure and which are physically separated from each other by said gas medium;

a means for ionizing said gas medium, said ionizing means being mixed in said enclosure and ionizing said gas medium so that it conducts electricity between said first and second rail electrodes along a series of arc channels in said gas medium; and

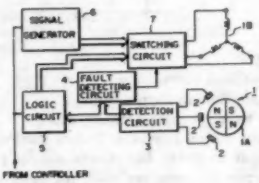
a means for generating a standing acoustic wave in said enclosure and said gas medium, said generating means being fixed within said enclosure and distributing said series of arc channels in said gas medium at location of standing wave nodes of said standing acoustic wave, said generating means thereby evenly distributing said arc channels along said first and second rail electrodes, since said arc channels will form at the location of the standing wave nodes where the gas medium's molecular number density is a minimum.

4,963,800

APPARATUS FOR CONTROLLING THROTTLE ACTUATOR

Yasuya Kajiwara, Hyogo, and Keiu Kawasaki, Gifu, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1989, Ser. No. 365,890
Claims priority, application Japan, Jun. 14, 1988, 63-147717
Int. Cl.[5] F02D 41/22
U.S. Cl. 318—254 5 Claims



1. In an apparatus for controlling a throttle actuator, including means for detecting the magnetic pole position of a rotor of a brushless motor connected to a throttle valve and means for driving said brushless motor in response to the magnetic pole position detecting means, the improvement comprising:

a fault detecting means for detecting any fault in said magnetic pole position detecting means; and

means responsive to said fault detecting means for steppingly driving said brushless motor independently of said magnetic pole position detecting means when a fault is detected.

2. An apparatus for controlling a throttle actuator comprising:

means (2,3) for detecting the position of a plurality of megnetic poles of a rotor (1) of a brushless motor and providing a magnetic pole position signal;

a first signal generating means (5) for generating pulses to drive a stator winding of said brushless motor in accordance with the magnetic pole position signal provided by said detecting means;

a second signal generating means (6) for generating pulse to drive the stator winding independently of said first signal generating means;

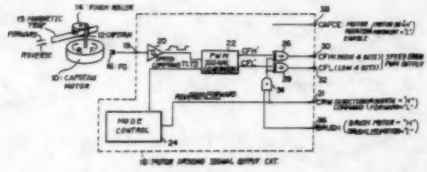
means (4) for determining whether or not said magnetic pole position signal is normal; and

a switching means (7) responsive to said determining means for selecting one of said first signal generating means and said second signal generating means to drive the stator winding.

4,963,801
MOTOR DRIVING CIRCUIT FOR SELECTIVITY DRIVING DIFFERENT MOTOR TYPES

Shohei Yamazaki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Aug. 9, 1988, Ser. No. 230,256
Claims priority, application Japan, Aug. 11, 1987, 62-122834[U]
Int. Cl.[5] H02P 5/16
U.S. Cl. 318—254 **5 Claims**



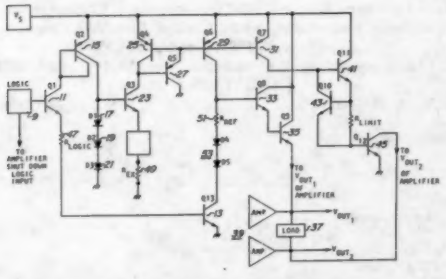
1. A motor driving circuit comprising:
- a motor type selection circuit for producing a signal representing a type of motor which has been selected;
- a motor speed detection circuit for producing a speed detection information signal corresponding to the rotation speed of said motor;
- a motor speed command circuit for producing a motor speed command signal;
- a motor rotation direction command circuit for producing a motor rotation direction command signal;
- a speed error detection circuit for detecting a speed error between actual speed and commanded speed of said motor in response to the speed detection information signal and the speed command signal and producing a speed error signal in accordance with result of the detection; and
- an inversion circuit connected to the output side of said speed error detection circuit for selectively inverting or non-inverting the speed error signal in response to states of the signal representing the type of the motor and the motor rotation direction command signal,

said motor being driven by the motor rotation direction command signal and the output of said inversion circuit.

4,963,802
RESISTOR PROGRAMMABLE VELOCITY CONTROLLER

William H. Gross, Sunnyvale, and James B. Cecil, Santa Clara, both of Calif., assignors to ELANTEC, Milpitas, Calif.

Filed Mar. 27, 1989, Ser. No. 329,261
Int. Cl.[5] H02P 1/22
U.S. Cl. 318—294 **4 Claims**

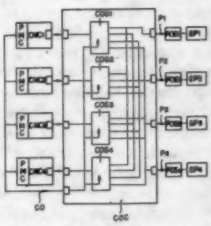


1. A circuit for supplying electrical signal to an actuator comprising:
- a first transistor including base, emitter and collector electrodes;
- a first plurality of diodes serially connected to the base electrode of the first transistor for supplying thereto forward conduction voltage drop thereacross;
- input means for selectively supplying forward conduction current to said first plurality of diodes in response to a control signal applied thereto;
- a first resistor connected to the emitter electrode of the first transistor for conducting current therethrough substantially proportional to the forward voltage drop across the first plurality of diodes and the resistance value of said first resistor;
- means coupled to the collector electrode of the first transistor for sensing the current therein and for supplying a first current proportional to the current in the first resistor;
- a second plurality of diodes and a second resistor connected to conduct said first current therethrough to produce a voltage drop thereacross;
- first output means for supplying output current proportional to said voltage drop across said second plurality of diodes and said second resistor; and
- second output means for supplying output current proportional to the current in the first resistor.

4,963,803
NUMERICALLY CONTROLLED MACHINE TOOL

Masuo Kokura, Tokyo, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP88/01243, § 371 Date Sep. 13, 1989, § 102(e) Date Sep. 13, 1989, PCT Pub. No. WO89/05484, PCT Pub. Date Jun. 15, 1989
PCT Filed Dec. 9, 1988, Ser. No. 392,924
Claims priority, application Japan, Dec. 11, 1987, 62-312085
Int. Cl.[5] G05B 19/18
U.S. Cl. 318—569 **1 Claim**

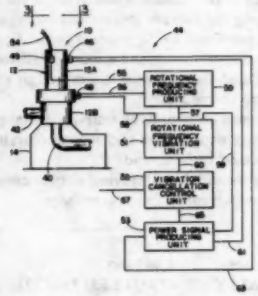


1. A numerically controlled machine tool having plural axes and being driven by a plurality of driving motors (SP(n)) each of which has an angular position sensing means (POS(n)) that provides an angular position signal (P(n)), comprising:
- a plurality of numerical control means (CNC(n)) for controlling the plurality of driving motors (SP(n)) in response to externaol numerical information, each of said numerical control means (CNC(n)) includes
  - a programmable controller means (PMC(n)) for generating a changing-over signal (CO), and
- a numerical control means changing-over means (COC) having a plurality of changing-over circuits (COS(n)) for connecting a selected one of the plural angular position sensing means (POS(n)) with a selected one of said plurality of numerical control means (CND(n)), in response to said changing-over signal (CO) so that said selected numerical control means (CNC(n)) is fed, in the reverse sense, said angular position signal (P(n)) sensed by the selected one of the plural angular position sensing means (POS(n)), and so that a driving motor associated with the selected angular position sensing means is controlled in response to said angular position signal (P(n)).

4,963,804
APPARATUS AND METHOD FOR REDUCING VIBRATION OF ROTATING MACHINERY

Thomas L. Geiger, Valencia, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 10, 1989, Ser. No. 377,503
Int. Cl.[5] F16F 15/00
U.S. Cl. 318—460 15 Claims


ROTATIONAL FREQUENCY REFERENCE UNIT
ROTATIONAL FREQUENCY VIBRATION UNIT
VIBRATION CANCELLATION CONTROL UNIT
POWER SIGNAL PRODUCING UNIT

1. A vibration reduction apparatus for use in reducing vibrations at a preselected location on a housing of a machine, the machine having a rotating component mounted to the housing which induces the vibrations therein, the rotating component being driven by an input electrical power signal supplied to the machine, said apparatus capable of reducing the vibrations in the machine housing without access to the rotating component, said vibration reduction apparatus comprising:

(a) at least one electromagnetic exciter mechanism for coupling externally on the machine housing remote from the vibration-inducing rotating component of the machine, said electromagnetic exciter mechanism being operable for inducing electromagnetic reaction forces in the machine housing which substantially reduce the magnitude of the vibrations induced by the rotating component;

(b) at least one vibration sensor attachable externally on the machine housing at the preselected location where the vibrations are to be reduced, said sensor for sensing the vibrations and generating an output signal representative thereof;

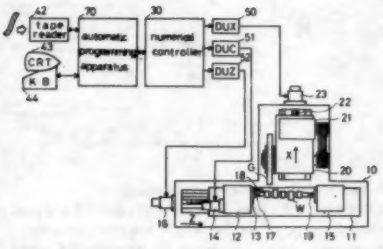
(c) an electrical power means electrically connected to said electromagnetic exciter mechanism for generating and applying an input power signal to said electromagnetic exciter mechanism for operating the same; and

(d) signal processing means coupled to the machine for sensing the frequency of the input power to the machine and generating an output signal representative thereof, said signal processing means being electrically connected to said power means and said vibration sensor for receiving said output signal from said sensor and processing said output signal representative of the induced vibrations together with said output signal representative of the input power frequency, comparing said processed signals with a standard signal representative of previous vibration correcting signals and in response thereto producing and applying a new correcting signal to said power means for modulating said input power signal to produce a corrected input power signal for operating said electromagnetic exciter mechanism to reduce the magnitude of vibrations induced at the preselected location on the machine housing by the rotating component.

4,963,805
NUMERICAL CONTROL APPARATUS FOR MACHINING NON-CIRCULAR WORKPIECES

Ikuo Suzuki, Chiryu; Takao Yoneda, Nagoya; Toshio Tsujiuchi, and Naoki Arimoto, both of Kariya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 14, 1989, Ser. No. 310,521
Claims priority, application Japan, Feb. 15, 1988, 63-32523
Int. Cl.[5] G06F 15/46
U.S. Cl. 318—569 6 Claims



1. A numerical control apparatus, in which the shape of a non-circular workpiece is converted into profile data indicating the relationship between the rotational angle θ of a main spindle and the position X of a tool-feed shaft responsive to specified lift data and a grinder diameter, and maintaining of said non-circular workpiece is controlled responsive to said profile data, comprising:

lift data memory means for storing said lift data,

tolerance memory means for storing the tolerance of the finished shape of said non-circular workpiece,

calculation means for smoothing said lift data within said tolerance,

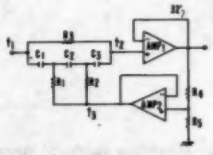
profile data conversion means for converting compensated lift data smoothed by said calculation means into the profile data, and

position control means for numerically controlling said main spindle rotational angle and said tool-feed shaft in response to said profile data, wherein said calculation means comprises means for determining a regression polynomial defining a regression curve approximating the point sequence given by said lift data within said tolerance to generate said compensated lift data from the point on said regression curve.

4,963,806
SERVO POSITIONING APPARATUS

Toru Shinohara, Kawasaki, and Takatoshi Sato, Kumagaya, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 9, 1989, Ser. No. 321,108
Claims priority, application Japan, Mar. 10, 1988, 63-056979
Int. Cl.[5] G05B 6/02
U.S. Cl. 318—621 26 Claims



1. A servo positioning apparatus, comprising:

positioning means, having a resonant frequency, for posi-

tioning an object and for outputting a position signal corresponding to a position of the object; and

a servo controller for outputting a servo signal to said positioning means in dependence upon the position signal, said servo controller including a bridged serial T-type notch filter having a notch frequency substantially equal to the resonant frequency.

4,963,807

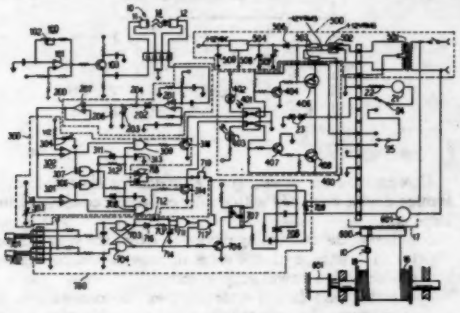
ULTRASONIC WEB EDGE GUIDE CIRCUIT

Jon Wendling, Algonquin, Ill., assignor to Zip-Pak Incorporated, Northbrook, Ill.

Filed Feb. 6, 1990, Ser. No. 475,999

Int. Cl.[5] B65H *23/192*; B06B *1/12*

U.S. Cl. 318—632 **18 Claims**



1. An ultrasonic servo controller for de-oscillating a web as the web is dispensed from a pay-off roll, comprising:

transmission means for generating an ultrasonic frequency signal and for transmitting said ultrasonic frequency signal across a gap;

receiver means, accepting said ultrasonic frequency signal transmitted by said transmission means across said gap, for converting said ultrasonic frequency signal into a signal strength voltage, said signal strength voltage having a voltage level proportional to an amount of web disposed between said transmission means and said receiver means;

logic control means, accepting said signal strength voltage from said receiver means, for generating a first control signal when said voltage level of said signal strength voltage decreases below a first predetermined level, and for generating a second control signal when said voltage level of said signal strength voltage increases above a second predetermined level; and,

motor control means, accepting said first and second control signals from said logic control means, for activating an oscillating motor to move said pay-off roll in a first direction in response to said first control signal, and for activating said oscillating motor to move said pay-off roll in a second direction in response to said second control signal, said first direction being a direction necessary to move an edge of said web out of said gap between said transmission means and said receiver means, said second direction being a direction necessary to move said edge of web into said gap between said transmission means and said receiver means.

16. A method for de-oscillating a web as it is dispensed from a pay-off roll comprising the steps of:

dispensing a web from a pay-off roll;

placing an ultrasonic transmitter and receiver in spaced apart relation at an edge of said web as said web is dispensed from said pay-off roll, said web proceeding through a gap between said ultrasonic transmitter and receiver;

using said ultrasonic transmitter to transmit an ultrasonic wave signal across said gap;

receiving said ultrasonic wave signal transmitted across said gap at said ultrasonic receiver;

ascertaining the amount of web in said gap by measuring the signal strength of said ultrasonic wave signal received at said receiver; and,

controlling an oscillating motor in response to said signal strength of said ultrasonic wave signal thereby to increase said amount of web between said ultrasonic transmitter and receiver when said signal strength proceeds above a predetermined level and to decrease said amount of web between said ultrasonic transmitter and receiver when said signal strength decreases below a further predetermined level.

4,963,808

MOTOR CONTROL APPARATUS

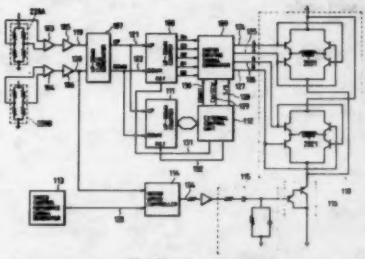
Akira Torisawa, Machida; Noriaki Itou, Yokohama; Masaaki Kakizaki, Kawasaki; Hiroshi Kato, Yokohama, and Shigeru Okamura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 259,259, Oct. 18, 1988, abandoned. This application Aug. 30, 1989, Ser. No. 401,483

Claims priority, application Japan, Oct. 21, 1987, 62-264018; Feb. 25, 1988, 63-040841; Feb. 25, 1988, 63-040842; Feb. 25, 1988, 63-040843

Int. Cl.[5] G05B *19/40*

U.S. Cl. 318—685 **10 Claims**



1. A motor control apparatus comprising:

an encoder fixed to a shaft of a rotor and having portions to be detected corresponding in number to an integer multiple of the number of magnetic poles of said rotor;

count means for counting the number of portions to be detected of said encoder upon rotation of said rotor at a predetermined position on a side of a stator; and

means for, when a count value from said count means has reached a predetermined value, performing energization switching to a coil of said stator.

4,963,809

LINEAR STEP MOTOR TYPE DRIVING APPARATUS FOR DRIVING A LONGITUDINALLY MOVABLE BODY

Meiji Shingu; Eiichi Yonezawa, and Hiroshi Fujii, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed May 24, 1989, Ser. No. 356,314

Claims priority, application Japan, May 25, 1988, 63-127928; Jan. 24, 1989, 1-14516

Int. Cl.[5] H02P *8/00*

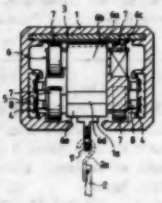
U.S. Cl. 318—696 **8 Claims**

1. An assembly for driving a vertically suspended body, comprising:

rail means defining an elongated channel having an upper portion, vertical side portions, and separated opposing lower portions, for longitudinal movement of the body;

motor means for moving the body longitudinally in a selected direction in said elongated channel, including a scale disposed in said upper portion of said channel, current supply means for supplying electric current disposed in said side portions of said channel, a moving armature

element configured and disposed to move in said channel, having an upper portion, a lower portion and opposite side portions, said moving armature element including an electromagnet having a core, a coil, and a plurality of pole teeth opposing said scale forming the upper portion of said moving armature element, a permanent magnet adjacent said electromagnet, and current collecting brushes electri-



cally connected to said electromagnet, projecting from said side portions of said moving armature element in opposing contact with said current supply means; and

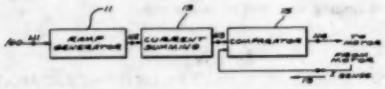
roller means abutting said upper and lower portions of said channel for rollingly supporting said moving armature element and defining a gap between said pole teeth and said scale.

4,963,810

VARIABLE LOAD MOTOR DRIVE CONTROL

Alejandro D. Rojas, Santa Ana, and John J. Quintus, Buena Park, both of Calif., assignors to Archive Corporation, Costa Mesa, Calif.

Filed Oct. 27, 1989, Ser. No. 428,096
Int. Cl.[5] H02P 5/16; G05B 11/28
U.S. Cl. 318—778 9 Claims



1. An apparatus, coupled to a device for signalling start-up of a motor, responsive to said signal, for providing start-up drive current to said motor, said motor having an input for said drive current and an output indicating current through said motor, comprising:

means for generating a ramp voltage on an output, having an input coupled to said device;

means for summing currents, having an input coupled to the output of said means for generating a ramp voltage, having an output for providing a reference voltage; and

means for comparing currents, having a first input coupled to said output of said means for summing currents and a second input coupled to said motor output, and an output coupled to said motor input,

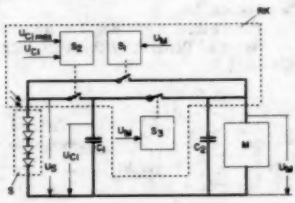
whereby said start-up drive current to said motor is ramped.

4,963,811

METHOD AND APPARATUS FOR POWERING ELECTRICAL AND ELECTRONIC CONSUMING DEVICES WITH SOLAR ENERGY

Hans R. Weber, 10, chemin du Grillon CH-1007, Lausanne, Switzerland

Filed Dec. 12, 1988, Ser. No. 282,520
Claims priority, application Switzerland, Dec. 10, 1987, 4840/87
Int. Cl.[5] H02J 7/00, 9/00
U.S. Cl. 320—1 19 Claims



1. A method for powering an electrical or electronic consuming device equipped with a solar collector, comprising the steps of:

connecting the consuming device to either the solar collector or a storage device so as to provide the consuming device with a power supply; and

connecting the solar collector to either the storage device so as to charge the storage device and the consuming device so as to operate the consuming device or the consuming device so as to operate the consuming device; and

making the above connections in dependence on the following criteria:

the power delivered from the solar collector;

the state of charge of the storage device;

the power necessary for operation of the consuming device; and

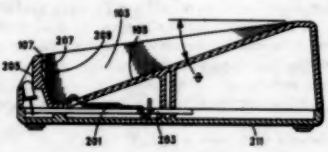
a previously defined switching priority comprising the proviso that: when the power delivered from the solar collector is just equal to the power necessary for operation of the consuming device, only the consuming device will be connected to the solar collector.

4,963,812

BATTERY CHARGER HOUSING FOR BATTERIES OF DIFFERING DIMENSIONS

Nicholas Mischenko, Mt. Prospect, and Albert L. Nagele, Wilmette, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 2, 1989, Ser. No. 415,517
Int. Cl.[5] H02J 7/00; H01M 10/46
U.S. Cl. 320—2 3 Claims



1. A housing for a battery charging apparatus which charges batteries of differing dimensions, the housing having top, bottom, front, and back external surfaces and comprising:

a recess disposed in the top external surface and having at least one wall and a bottom surface, said bottom surface

sloping from the top external surface toward the bottom external surface and the front external surface;

a wall of said recess, extending from said bottom surface of said recess to the top external surface, one side of said wall forming at least a portion of the front external surface; and

a lip portion, disposed on a second side of said wall and near the top external surface, having a first surface on one side of said lip portion disposed between the top external surface and said bottom surface of said recess, a second surface disposed on a second side of said lip portion and between said first surface and said bottom surface of said recess, and a third surface disposed on said second side of said lip portion and between said second surface and said bottom surface of said recess,

whereby a battery of a first dimension may be captivated between said second surface of said lip portion and said bottom surface of said recess and a battery of a second dimension may be captivated between said third surface of said lip portion and said bottom surface of said recess

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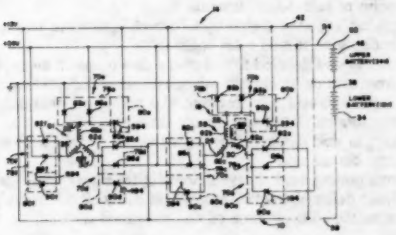
4,963,813

CONTROL PROVIDING PROGRESSIVE CHARGING IN A DUAL VOLTAGE CHARGING SYSTEM

Donald Bolle, Glenview, Ill., assignor to C. E. Niehoff & Co., Evanston, Ill.

Filed Dec. 2, 1988, Ser. No. 279,473
Int. Cl.[5] H02J 7/14
U.S. Cl. 320—17 **12 Claims**



1. In an electrical charging system of the type comprising an electrical current generating device having at least three output nodes, and first and second voltage buses each having a respective voltage, a control system comprising:

at least three switching circuits, each interconnected to a respective one of the output nodes and the voltage buses, each switching circuit operative in a first mode to supply current from the respective output node to the first voltage bus, and in a second mode to supply current from the respective output node to the second voltage bus; and

means, responsive to the voltage buses, for controlling the switching circuits to place, one, then two, then three of the switching circuits in the second mode as the voltage of the second bus progressively deviates from a target value to vary the rate at which the second bus is charged.

4,963,814

REGULATED BIFURCATED POWER SUPPLY

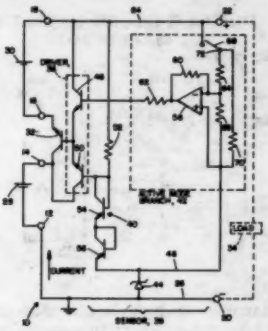
Robert A. Parks, Springport, and Bradley E. White, Zionsville, both of Ind., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.

Filed Dec. 15, 1989, Ser. No. 451,107
Int. Cl.[5] G05F 1/613
U.S. Cl. 323—274 **11 Claims**

1. A regulated power supply comprising:

a first input terminal, a second input terminal, a third input terminal and a fourth input terminal, said first and said second input terminals constituting a first input terminal pair for receiving a first input voltage, said third and said fourth input terminals constituting a second input terminal pair for receiving a second input voltage;

a variable impedance means connected between said second input terminal and said third input terminal, said variable impedance means providing a path of current flow between said second input terminal and said third input terminal and introducing a voltage drop along the path in a direction of the current flow, the power supply providing an output voltage comprising the sum of said first and said second input voltages minus said voltage drop of said impedance means;



means for sensing said output voltage;

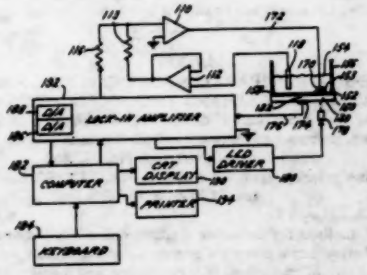
driver means coupled between said sensing means and said impedance means for operating said impedance means to increase the voltage drop in response to a sensed increase of said output voltage by said sensing means, thereby to regulate the output voltage of the power supply.

4,963,815

PHOTORESPONSIVE ELECTRODE FOR DETERMINATION OF REDOX POTENTIAL

Dean Hafeman, Hillsborough, Calif., assignor to Molecular Devices Corporation, Palo Alto, Calif.

Filed Feb. 10, 1987, Ser. No. 72,168
Int. Cl.[5] G01N 27/07, 27/56, 21/27
U.S. Cl. 324—715 **38 Claims**



1. A field effect device for determining the redox potential of a liquid electrolyte medium, said device comprising:

as a detection unit:

(i) a base photoresponsive semiconductive layer;

(ii) an insulative layer covering at least a portion of a surface of said semiconductive layer; and

(iii) an electronically conductive layer mounted on said insulative layer or mounted on said semiconductive layer at the uncovered portion of said surface;

light irradiation means for irradiating said base layer to produce minority carriers in juxtaposition to said electronically conductive layer; and

means for connecting said base layer to a circuit.

4,963,816

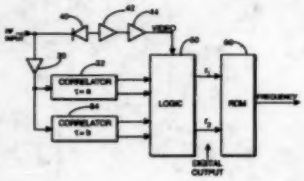
INSTANTANEOUS FREQUENCY MEASUREMENT (IFM) RECEIVER WITH ONLY TWO DELAY LINES

James B. Y. Tsui, Centerville, and William S. McCormick, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 5, 1989, Ser. No. 376,274

Int. Cl.[5] G01R *23/16*

U.S. Cl. 324—77 H **3 Claims**



1. An IFM receiver having a plurality of correlators, with an individual delay line in each correlator, means coupling an RF signal source to each correlator, each correlator having phase discrimination means, detector means and differential amplifier means to provide output signals proportional to sin $\omega\tau$ and cos $\omega\tau$, ω being an angular frequency of an RF signal from the RF signal source, and logic means using said output signals to derive a phase value for each correlator, the phase value being a remainder less than 2π for ω, any multiples of 2π being lost so that there is an ambiguity in the value which is resolved by comparing the outputs of the plurality of correlators;

the improvement in which there are two correlators and therefore two delay lines, said two delay lines having lengths a and b respectively which are relatively prime, said logic means provides respective remainder phase values r_1 and r_2 less that 2π for the two correlators, and frequency-determining means for finding the frequency of an RF signal using the equations

$$r_1=\omega a-m\cdot 2\pi \quad (1)$$

$$r_2=\omega b-n\cdot 2\pi \quad (2)$$

where m and n are unknown integers.

4,963,817

METHOD AND APPARATUS FOR DETECTING A PHASE DIFFERENCE BETWEEN TWO DIGITAL SIGNALS

Kiyoshi Kohiyama, and Hidenaga Takahashi, both of Tokyo, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 28, 1989, Ser. No. 372,452

Claims priority, application Japan, Jun. 28, 1988, 63-162094

Int. Cl.[5] G01R *25/00*

U.S. Cl. 324—83 D **9 Claims**

1. A method for detecting a phase difference between two digital signals in a phase difference detecting circuit including a delay circuit comprised of series-connected n delay elements having the same delay characteristics, an n bit register with each bit connected to connecting points of said delay elements respectively, and a compensation circuit for compensating a phase difference, comprising the steps of:

applying a test signal to an input terminal of said delay circuit, and taking out a delayed test signal from each of said connecting points of said delay elements;

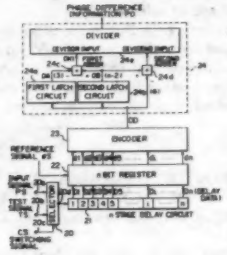
applying a reference signal having a predetermined cycle twice to said n bit register time before said test signal applied to said delay circuit is delivered to the last delay element;

taking in said delayed test signal to an n bit register when a first of said reference signals is applied to said n bit register and a second of said reference signals is applied to said n bit register, and taking out two kinds of delayed test signals from every bit of said n bit register on a one-by-one basis;

latching said two kinds of delayed data one-by-one in a different data latching area in said compensation circuit;

calculating delay characteristics of said delay circuit using said two kinds of delayed test signals and a predetermined cycle time of said reference signal;

applying a first digital signal to be subjected to phase difference detection to said delay circuit, and taking out the



delayed said first digital signal from every connecting point of said delay elements;

applying a second digital signal which is equal to said reference signal to said n bit register;

taking in said delayed first digital signal to said n bit register from said delay circuits when said second digital signal is applied to said n bit register, and taking out said delayed first digital signal at the same time;

taking in said delayed first digital signal to said compensation circuit, and

compensating said delayed first digital signal using calculated delay characteristics of said delay circuit and a predetermined cycle time of said reference signal.

4,963,818

CURRENT SENSOR HAVING AN ELEMENT MADE OF AMORPHOUS MAGNETIC METAL

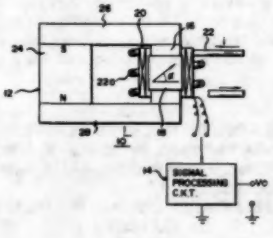
Masao Obama, Yokosuka, and Masaaki Kikuchi, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 18, 1989, Ser. No. 408,366

Claims priority, application Japan, Sep. 22, 1988, 63-238017; Aug. 16, 1989, 1-210135

Int. Cl.[5] G01R *33/00*; H01F *3/04*

U.S. Cl. 324—117 R **10 Claims**



1. A current sensor comprising:

an element made of amorphous magnetic metal whose magnetic permeability varies in accordance with the intensity of a first magnetic field generated from a current flowing

through a conductor, said element having single-axis magnetic anisotropy and an axis of easy magnetization inclined at a predetermined angle to a direction in which said first magnetic field extends;

magnetic field-applying means for applying a DC-bias magnetic field to said element, said DC-magnetic field extending parallel to the first magnetic field;

a coil exhibiting impedance corresponding to the magnetic permeability of said element, said coil generating a second magnetic field which is applied to said element and extends parallel to the first magnetic field, and the impedance of said coil being determined by the component of a saturation magnetization of said element in the direction of said second magnetic field; and

output means for outputting a signal corresponding to the impedance of said coil, said output means having a bridge circuit, specified side of which is constituted by said coil.

4,963,819

HIGH VOLTAGE APPARATUS

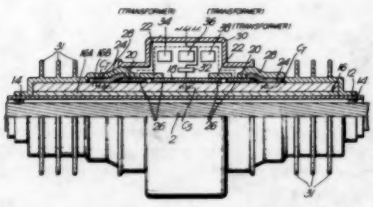
Graham J. Clarke, Ashbury; Gordon E. Hibbert, Swindon, both of Great Britain; Helge Jensen, Zorneding, Fed. Rep. of Germany, and Robin J. T. Clabburn, Sevenhampton, Great Britain, assignors to Raychem Limited, London, England

Continuation of Ser. No. 751,768, Jul. 2, 1985, abandoned. This application Sep. 26, 1988, Ser. No. 251,050

Claims priority, application United Kingdom, Jul. 2, 1984, 8416791; Jul. 2, 1984, 8416792

Int. Cl.[5] G01R *15/06*; H02G *15/08*

U.S. Cl. 324—126 **12 Claims**



1. High voltage apparatus comprising a capacitor of generally cylindrical configuration, the capacitor comprising; an elongate, inner electrode; solid resilient, electrical insulation material mounted on the inner electrode to provide the dielectric of the capacitor; an outer cylindrical electrode substantially coaxial with the inner electrode and mounted on a portion only of the outer surface of the insulation material, the inner and outer electrodes and the insulation material being arranged to provide the generally cylindrical capacitor with a known capacitance; at least one substantially cylindrical guard ring electrode mounted on the outer surface of the insulation material so as to be spaced apart by a gap from an end of the outer electrode; and stress control means comprising a material having a specific impedance of between about 10^6 ohm-cm and 10^{10} ohm-cm and extending across said gap arranged to overlap and make electrical contact with the outer electrode and the or each of said guard ring electrodes, thereby to control the electrical stress between said electrodes.

4,963,820

ENERGY METER

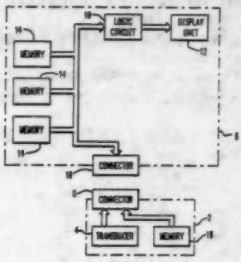
Roger E. Medlin, Raleigh, N.C., assignor to ABB Power T & D Company, Blue Bell, Pa.

Filed May 11, 1989, Ser. No. 350,266

Int. Cl.[5] G01R *15/08, 11/64*

U.S. Cl. 324—142 **9 Claims**

1. In an energy meter comprising a meter chassis having a transducer connected to sense energy usage and to provide an output having a fixed relation to the sensed energy usage, and a replaceable register connectable to the transducer for converting the output provided by the transducer into a readable energy usage indication, the improvement comprising: transducer identifying means secured to said chassis and coded to



identify the fixed relation between the transducer output and the sensed energy usage; and transducer sensing means secured to said register for coupling with said transducer identifying means when said register is connected to said transducer.

4,963,821

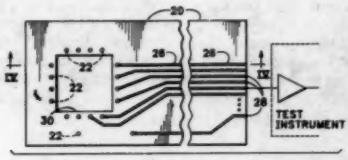
PROBE AND METHOD FOR TESTING A POPULATED CIRCUIT BOARD

Bozidar Janko, Portland; Zoran O. Sekulic, Beaverton, both of Oreg., and Mark F. Bitetto, Sumner, Wash., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 338,712, Apr. 14, 1989. This application Apr. 14, 1989, Ser. No. 338,786

Int. Cl.[5] G01R *31/02, 1/06*

U.S. Cl. 324—158 P **8 Claims**



7. In combination:

a populated circuit board comprising a support member having a major surface and an electronic component mounted on the support member at the major surface thereof, the circuit board having a plurality of test points exposed at the major surface at predetermined positions relative to said component, and

apparatus for testing the circuit board, the apparatus comprising:

a probe comprising a flexible sheet of dielectric material having first and second main faces and formed with an opening extending therethrough and sized and shaped to receive the electronic component, contact pads exposed at the first main face of the sheet at positions relative to the opening corresponding to the positions of the test points relative to the electronic component, and conductor runs adhered to the flexible sheet and connecting the contact pads to probe terminals,

means for applying pressure to the probe when the probe is positioned with the first surface of the sheet in confronting relationship with the circuit board and the opening in the sheet is in registration with the electronic component, whereby the contact pads are brought into contact with the test points respectively, and

a test instrument connected to the terminals of the probe for

observing electrical signals transmitted from the test points by the probe.

4,963,822

METHOD OF TESTING CIRCUIT BOARDS AND THE LIKE

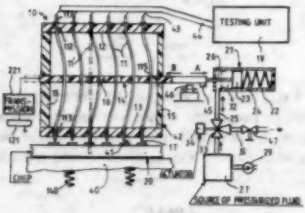
Manfred Prokopp, Am Felder 27, D-6980 Wertheim-Reicholzheim, Fed. Rep. of Germany

Filed May 26, 1989, Ser. No. 358,441

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1988, 3818686

Int. Cl.[5] G01R *1/06, 31/02*

U.S. Cl. 324—158 P **7 Claims**



1. A method of contacting circuit boards, and analogous components having a plurality of electric contacts with elongated flexible resilient test probes each of which has a contact-engaging front end, comprising the steps of reciprocably guiding the probes in first regions adjacent the front ends; supporting the probes in second regions remote from the front ends against movement toward the first regions; flexing the probes intermediate the first and second regions in a predetermined direction with a predetermined force to thereby retract the front ends toward the second regions and to cause the thus flexed probes to store energy; positioning the retracted front ends and the contacts of the component to be tested close to or in actual engagement with each other; and at least reducing said force to thus enable the front ends to bear against the contacts of the component to be tested due to the tendency of probes to dissipate stored energy.

4,963,823

ELECTRON BEAM MEASURING INSTRUMENT

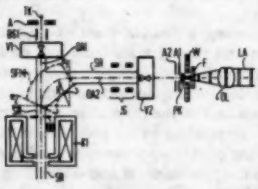
Johann Otto, Bad Toelz, and Erich Plies, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 9, 1989, Ser. No. 349,432

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1988, 3821643

Int. Cl.[5] G01R *31/28*

U.S. Cl. 324—158 R **28 Claims**



1. An electron beam measuring instrument for examination of a specimen comprising, a first electron source (TK) producing a first beam and mounted on a first beam axis (OA1), a first beam blanking system (BS1) through which said first beam passes, a beam blanking diaphragm (BB) mounted on said first beam axis, at least one condenser lens (K1, K2) including an objective lens (SO) for focusing the electrons (PE) which are guided along the first beam axis (OA1) onto said specimen (IC), a spectrometer detector system (SO, DT) for the documenting secondary and back-scattered particles triggered at the specimen (IC), a second electron source mounted on a second beam axis (OA2), means for stigmatic imaging the second electron source onto the first beam axis (OA1).

4,963,824

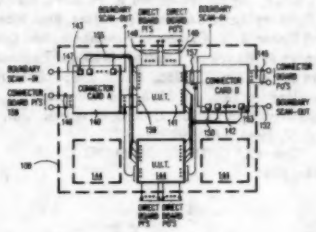
DIAGNOSTICS OF A BOARD CONTAINING A PLURALITY OF HYBRID ELECTRONIC COMPONENTS

Edward P. Hsieh, Bedford Hills, N.Y.; Maurice T. McMahon, San Jose, Calif., and Henri D. Schnurmann, Monsey, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 4, 1988, Ser. No. 267,409

Int. Cl.[5] G01R *1/02, 1/04*

U.S. Cl. 324—158 R **13 Claims**



1. A method for isolating and diagnosing in situ failing or defective components mounted on a circuit board having a plurality of interconnected components mounted thereon, the circuit board having a plurality of board input/output pins, the method comprising the steps of:

1. removing at least one said component from said circuit board;
2. installing a connector card in place of at least one said removed component, said connector card providing means to couple at least some of the input/output pins of a selected component mounted on said circuit board to some of said board input/output pins;
3. applying test patterns to at least some said board input-/output pins coupled to said selected component; and
4. recording the responses from said selected device on at least some of said board input/output pins in response to said test patterns.

4,963,825

METHOD OF SCREENING EPROM-RELATED DEVICES FOR ENDURANCE FAILURE

Neal R. Mielke, Redwood City, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 21, 1989, Ser. No. 455,511

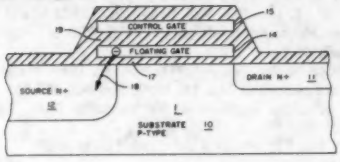
Int. Cl.[5] G01R *31/28*

U.S. Cl. 324—158 R **15 Claims**

1. A method of screening an integrated circuit (IC) for endurance failure, said IC being of the type which contains an array of floating gate memory cells which are programmed and/or erased by tunnelling of electrons to/from a floating gate through a tunnel oxide, said method comprising the steps of:

measuring either the program or erase speed of said cells to obtain a distribution in which the percentage of bits either programmed or erased is available as a function of the applied voltage threshold, said distribution being charac-

terized as having a tail representing the percentage of said bits which program or erase relatively fast; and



classifying said IC as being likely to suffer early endurance failure if said tail exceeds a certain percentage of the total bits in said array, otherwise certifying said IC as being endurance reliable.

4,963,826

REFERENCE STANDARD BLOCK FOR USE IN NONDESTRUCTIVE TEST PROBE CALIBRATION AND METHOD OF MANUFACTURE THEREOF

Thomas E. Capobianco, Arvada; William P. Dubé, Denver, both of Colo., and Kenneth W. Fizer, Virginia Beach, Va., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Jul. 18, 1989, Ser. No. 381,553

Int. Cl.[5] G01R *35/00*

U.S. Cl. 324—202 **20 Claims**

14. A reference standard block for calibrating nondestructive magnetic testing equipment, comprising a metallic material having a compressed indentation of prescribed dimensions and having a longitudinal axis formed by compressing said block in a direction generally transverse said longitudinal axis the block being responsive to a magnetically induced eddy current to provide an indication of the presence of the block indentation incident to nondestructive magnetic testing equipment calibration.

4,963,827

INTERMITTENTLY ACTIVATED MAGNETIC SHIELD ARRANGEMENT FOR REDUCING NOISE AND OFFSETS IN SOLID STATE MAGNETIC FIELD SENSORS

Radivoje Popovic, Fridbach, and Thomas Seitz, Hasenbühlweg, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Aug. 24, 1989, Ser. No. 398,228

Claims priority, application Switzerland, Sep. 13, 1988, 03413/88

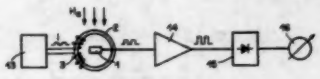
Int. Cl.[5] G01R *33/06, 33/04*

U.S. Cl. 324—251 **14 Claims**

1. A combination comprising

a Hall element for producing an output signal which serves as a measurement of a magnetic field, and

means for reducing the effects of noise and offset voltage on the output signal of said Hall element comprising a controllable magnetic shield enclosing said Hall element for intermittently shielding the Hall element from the magnetic field to be measured and activating means coupled to



the controlled magnetic shield for intermittently activating said shield at a predetermined frequency.

4,963,828

PICTURE QUALITY TESTING METHOD AND APPARATUS FOR COLOR CATHODE-RAY TUBE

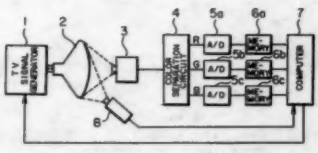
Keisuke Kawame; Toshio Asano, both of Yokohama, and Jun Mochizuki, Yamato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 13, 1989, Ser. No. 309,361

Claims priority, application Japan, Mar. 4, 1988, 63-49502; Apr. 5, 1988, 63-82289

Int. Cl.[5] G01R *31/24*

U.S. Cl. 324—404 **5 Claims**



2. A method of testing the quality of a picture displayed on a color cathode-ray tube, comprising the steps of:

displaying a white raster on a phosphor screen of the color cathode-ray tube to be tested and deriving color image data from the phosphor screen;

subjecting said color image data to chromaticity transformation for obtaining a chromaticity image including chromaticity image data;

extracting a selected nonuniform color portion from said chromaticity image;

calculating the average chromaticity, area and edge intensity of said extracted nonuniform color portion for calculating quantities of features of said nonuniform color portion; and

calculating an evaluated value of white uniformity on the basis of said feature quantities.

4,963,829

SHAFT ROTATION ANALYZER USING VARIABLE CAPACITANCE TRANSDUCER MAINTAINED AT A CONSTANT VOLTAGE

John A. Wereb, 5507C Sutton La., P.O. Box 703, Willoughby, Ohio 44094

Filed Mar. 21, 1988, Ser. No. 171,368

Int. Cl.[5] G01R *27/26*

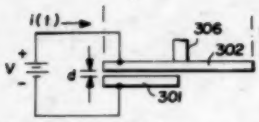
U.S. Cl. 324—660 **46 Claims**

1. A shaft rotation analyzer for analyzing the motion of a rotating shaft, said analyzer comprising:

a substantially constant direct current (DC) voltage source;

capacitive transducer means electrically connected to said constant DC voltage source and mechanically coupled to said shaft for changing capacitance with time in response to the instantaneous velocity of said shaft and for causing a time-varying current to flow to/from said voltage source in response to said shaft rotation; and

converting means electrically couple to said capacitor transducer means for converting said time-varying current to a



signal directly indicating the instantaneous angular speed of said shaft.

4,963,830

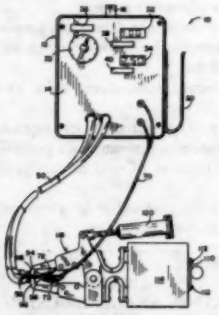
PORTABLE IMPEDANCE METER FOR RESISTANCE WELDING EQUIPMENT

Dietrich K. Roth, Walker, and Kurt A. Hofman, Wyoming, both of Mich., assignors to RoMan Manufacturing, Inc., Grand Rapids, Mich.

Filed Jul. 19, 1989, Ser. No. 381,955

Int. Cl.[5] G01R *27/08, 27/16*

U.S. Cl. 324—715 **16 Claims**



1. An impedance meter for closely approximating the impedance of a resistance welding apparatus between first and second points thereon, said meter comprising:

current supply means for supplying an alternating current of a preselected amperage;

conductor means for conducting the current from said current supply means to the first and second points of the resistance welding apparatus;

voltage meter means for measuring the voltage across the first and second points of the welding apparatus when the current is conducted therethrough; and

display means for displaying a number dependent on the measured voltage, said number being indicative of the impedance of said welding apparatus.

4,963,831

SELF ADJUSTING FREQUENCY DEMODULATING INTEGRATED CIRCUIT

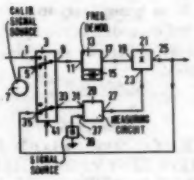
Armand M. Stulvenwold; Johannes P. M. Van Lammeren; Henricus T. P. J. van Elk, and Bruno P. J. M. Motté, all of Nijmegen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 340,971, Apr. 20, 1989, abandoned. This application Jan. 16, 1990, Ser. No. 465,561

Claims priority, application Netherlands, May 2, 1988, 8801143

Int. Cl.[5] H03D *3/24, 3/26;* H04N *9/66*

U.S. Cl. 329—318 **16 Claims**



9. A frequency demodulation circuit having an operating state and a calibration state, and comprising:

A frequency demodulation including an inductance-free circuit for determining the tuning of the demodulator and having at least one capacitance element;

a measuring circuit coupled to an output of said frequency demodulator for measuring a signal which is representative of the tuning of the demodulation circuit, said measuring circuit calculating, during said calibration state, a correction factor, and having a control signal output for supplying said correction factor; and

a tuning correction circuit coupled to said frequency demodulator and including a multiplier for controlling an output signal amplitude of the frequency demodulation circuit, said tuning correction circuit having an input coupled to said control signal output of said measuring circuit for receiving said correction factor.

4,963,832

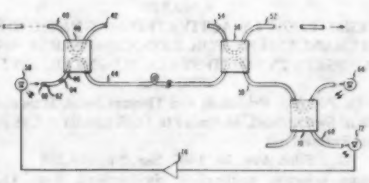
ERBIUM-DOPED FIBER AMPLIFIER COUPLING DEVICE

Emmanuel Desurvire; Randy C. Giles, both of Middletown, and Matthew S. Whalen, Rumson, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 8, 1989, Ser. No. 390,864

Int. Cl.[5] G02B *6/26;* H01S *3/094*

U.S. Cl. 330—4.3 **3 Claims**



1. An optical communication system comprising a transmission fiber for transmitting an optical signal, said transmission fiber having a first mode diameter, a rare earth doped optical amplifying fiber having a second mode diameter wherein said first diameter and second diameter are unequal, a source of pump energy for pumping said rare earth doped optical amplifying fiber, a dichroic coupler comprising two fibers, one fiber

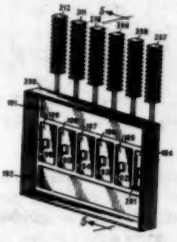
being the transmission fiber and the other fiber being the rare earth doped optical amplifying fiber, said fibers of the coupler juxtaposed to couple the signal in the transmission fiber to the amplifying fiber and to inhibit the coupling of pump energy in the amplifying fiber to the transmission fiber.

4,963,833

HIGH POWERED AMPLIFIER AND HEAT SINKING APPARATUS

Michael C. Mountz, Carol Stream, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 12, 1989, Ser. No. 364,385
Int. Cl.[5] H03F 1/00
U.S. Cl. 330—65 **7 Claims**



1. An improved radio frequency (RF) power amplifier having:

power amplifier chassis means for providing an enclosed RF shielding region, for housing at least part of the RF power amplifier, and by providing a ground plane;

power amplifier means, operably associated with the power amplifier chassis means and located substantially within the enclosed RF shielding region, for amplifying RF signals, the power amplifier means including, at least;

a power amplifying module consisting of, at least, a substrate having at least one major surface and a power transistor having a primary heat transfer area; and

RF signal receiving means having a substrate with at least one major surface, operably associated with the power amplifier module, for receiving RF signals;

DC source means, operably associated with the power amplifier means and the power amplifier chassis means, for supplying at least one DC voltage to the power amplifier means;

wherein the improvement comprises:

exposing means, operably associated with the power amplifier chassis means, for exposing the primary heat transfer area to outside the enclosed RF shielding region; and

heat sinking means, operably coupled to the primary heat transfer area and located substantially outside the enclosed RF shielding region of the power amplifier chassis means, for transferring and dissipating heat generated by the power transistor substantially outside the enclosed RF shielding region.

4,963,834

OPERATIONAL AMPLIFIER

Akira Yukawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

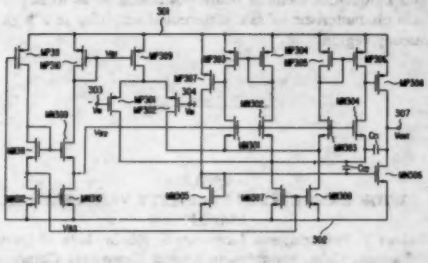
Filed Jan. 23, 1989, Ser. No. 299,390
Claims priority, application Japan, Jan. 21, 1988, 63-11958; Jan. 21, 1988, 63-11959
Int. Cl.[5] H03F 3/45
U.S. Cl. 330—253 **4 Claims**

1. An operational amplifier comprising,

a differential input stage to which input terminals are connected,

first and second folded cascode stages connected to said differential input stage, and driven by a common output of said differential input stage,

an inverting amplifier including two transistors, one of said two transistors being connected through a current mirror



to said first folded cascade stage, and the other of said two transistors being connected directly to the second folded cascode stage.

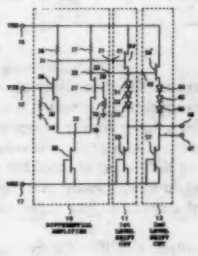
an output terminal connected to a connecting point of said two transistors.

4,963,835

DIFFERENTIAL AMPLIFIER WITH AN IMPROVED GAIN CHARACTERISTIC IN A HIGH FREQUENCY REGION

Yasuo Saitoh, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 8, 1989, Ser. No. 391,285
Claims priority, application Japan, Aug. 9, 1988, 63-199425
Int. Cl.[5] H03F 3/45
U.S. Cl. 330—253 **3 Claims**



1. A differential amplifier comprising first and second power supply terminals supplied with first and second power source potentials, respectively, a reference voltage terminal supplied with a reference voltage between said first and said second power source potentials, an input terminal supplied with an input signal having an input voltage which has an input D.C. level of said reference voltage, a reference terminal for being supplied with said reference voltage, differentially operable first and second field effect transistors having first and second gate terminals, first and second drain terminals, and first and second source terminals, respectively, resistors between said first power supply terminal and said first and said second drain terminals, a constant current source between said first and said second source terminals and said second power supply terminal, said first gate terminal being connected to said input terminal and said second gate terminal being connected to said reference terminal, and first and second output terminals connected to said first and said second drain terminals for producing first and second output signals having first and second output voltages, respectively, each of said first and second output voltages being representative of a difference between said input voltage and said reference voltage, said first and said

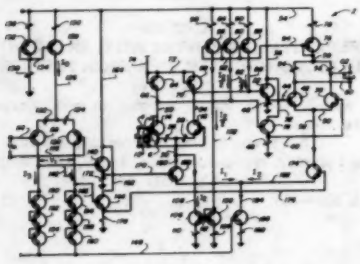
second output voltages having inverted polarities relative to each other, wherein the improvement comprises an inductance element having one end connected to said reference terminal and another end connected to said reference voltage terminal, said inductance element being positioned so as to improve a gain characteristic of said differential amplifier in a high frequency region.

4,963,836

WIDE RANGE HIGH STABILITY VARIABLE GAIN AMPLIFIER

Robert Y. Noguchi, and Lawrence E. Roohr, both of Colorado Springs, Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 23, 1989, Ser. No. 370,803
Int. Cl.[5] H03F 3/45
U.S. Cl. 330—254 **27 Claims**



1. A temperature stabilized amplifier circuit having an amplification factor exponentially proportional to a gain control signal for amplifying input signals comprising:

a differential input amplifier for receiving said input signals and providing a differential amplifier signal linearly proportional to said input signals, said input amplifier having a differential current supply input and a current return output;

a differential output amplifier for receiving said differential amplifier signal and providing an amplified output signal proportional to said amplifier signal, said output amplifier having a current supply input and a current return output;

a differential gain control amplifier for receiving said gain control signal and providing a differential gain control amplifier signal exponentially proportional to said gain control signal, said gain control amplifier having a current return output;

gain control amplifier current return control means for regulating current returned from said gain amplifier current return output at a selected level;

input amplifier current source control means for supplying a first input current and a second input current to said input amplifier differential current supply input, each at a level of approximately one half of the current fed to said output amplifier current supply input;

input amplifier current return control means for returning current from said input amplifier current return output in inverse linear proportion to said gain control amplifier signal; and

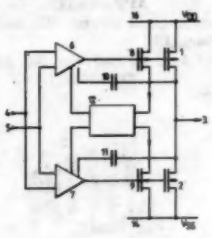
output amplifier control means for returning current from said output amplifier current return output in direct linear proportion to said gain control amplifier signal.

4,963,837

AMPLIFIERS

Ian J. Dedic, Northolt, England, assignor to The General Electric Company, p.l.c., England

Filed Jun. 1, 1989, Ser. No. 360,005
Claims priority, application United Kingdom, Jun. 6, 1988, 8813349
Int. Cl.[5] H03F 3/30
U.S. Cl. 330—264 **4 Claims**



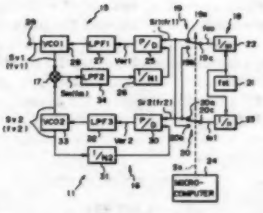
1. A complementary symmetry metal oxide semiconductor (CMOS) integrated circuit push-pull amplifier, comprising: first and second field effect output transistors of opposite conductivity type; energizing supply means; means connecting the current paths of said output transistors in series across said energizing supply means; first and second input circuit means for applying input signal voltages to said first and second output transistors respectively; a control current path connected between said first and second input circuit means; and feedback means responsive to the value of current flow through said first and second output transistors to maintain substantially constant the value of current flow through said control current path, said feedback means including means to effect substantially a predetermined value of current flow in common through said first and second output transistors.

4,963,838

FREQUENCY SYNTHESIZER

Nobuo Hareyama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 22, 1989, Ser. No. 455,186
Claims priority, application Japan, Jan. 13, 1989, 1-007366
Int. Cl.[5] H03L 7/16
U.S. Cl. 331—2 **14 Claims**



1. In a frequency synthesizer having first and second phase locked loops each including variable frequency oscillating means and frequency dividing means having a variable frequency dividing ratio, mixing means receiving outputs of the variable frequency oscillating means in said first and second phase locked loops, respectively, and means for deriving an output signal whose frequency is variable in predetermined frequency steps; the combination of:

means for establishing a first frequency change mode in which frequencies of said outputs of said variable fre-

quency oscillating means in said first and second phase locked loops, respectively, change in the same direction;

means for establishing a second frequency change mode in which said frequencies of the outputs of said variable frequency oscillating means in said first and second phase locked loops, respectively, change in opposite directions; and

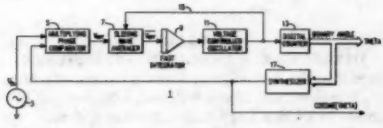
control means responsive to said frequency dividing ratio of said frequency dividing means in one of said first and second phase locked loops for selecting one of said first and second frequency change modes.

4,963,839

WIDE BANDWIDTH PHASE LOCKED LOOP CIRCUIT WITH SLIDING WINDOW AVERAGER

Eric J. Stacey, Penn Hills Twp., Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1989, Ser. No. 401,672
Int. Cl.[5] H03L 7/087, 7/093, 7/18
U.S. Cl. 331—17 21 Claims



1. A phase locked loop circuit comprising:

phase comparator means generating a phase error signal representative of a phase error between a source signal having a selected fundamental frequency and a synthesized reference signal having a predetermined phase relationship to the source signal,

a sliding window averager generating an average phase error signal from a predetermined number of most recent samples of said phase error signal taken at clocked intervals determined by a clock signal,

means providing said clock signal at a frequency greater than the fundamental frequency of said source signal, and

reference signal generating means generating said synthesized reference signal having said predetermined phase relationship to said source signal, said reference signal generating means being responsive to said average phase error signal to vary the phase of said synthesized reference signal to decrease the phase error in the predetermined phase relationship between the source signal and the synthesized reference signal thereby locking the synthesized reference signal in the predetermined phase relationship to the source signal when the average phase error signal is substantially zero.

4,963,840

DELAY-CONTROLLED RELAXATION OSCILLATOR WITH REDUCED POWER CONSUMPTION

Werner F. Thommen, Staefa, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 6, 1989, Ser. No. 433,065
Claims priority, application Netherlands, Nov. 7, 1988, 8802719
Int. Cl.[5] H03K 3/02
U.S. Cl. 331—111 11 Claims

1. An oscillator comprising:

a capacitance;

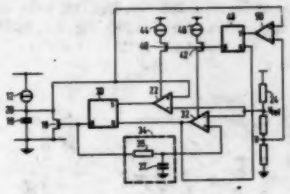
a means for charging the capacitance;

a means for discharging the capacitance;

a control comparator for comparing a capacitance voltage, representative of a degree of charge on the capacitance, with a reference voltage;

a monostable multivibrator means having a control input coupled to an output of the control comparator for activating the discharging means for a predetermined time interval;

and switching means for switching a power supply for the control comparator into a stand-by mode at least after a



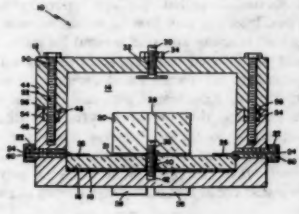
change-over from charging to discharging of the capacitance or after a change-over from discharging to charging, and into an operating mode at least before a change-over from discharging to charging, or before a change-over from charging to discharging, respectively.

4,963,841

DIELECTRIC RESONATOR FILTER

Stephen M. Sparagna, Milton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 25, 1989, Ser. No. 357,449
Int. Cl.[5] H01P 1/20, 7/10
U.S. Cl. 333—202 22 Claims



1. A dielectric resonator filter comprising:

an electrically-conductive housing which defines a cavity therein;

a dielectric substrate bonded to an inner surface of said housing;

terminal means coupled through said housing onto said dielectric substrate for transferring energy at a predetermined frequency into and out of said filter;

a coupling structure on a surface of said dielectric substrate, said coupling structure coupled at one end thereof to said terminal means, said coupling structure comprising a plurality of electrically-conductive tracks forming an arcuate segmented line, said arcuate segmented line being substantially concentric with the center of said dielectric substrate; and

a dielectric resonator bonded directly to said dielectric substrate at a predetermined position with respect to the cavity walls of said housing, wherein the bonding of said resonator to said substrate and said substrate to said housing occurs at elevated pressure to minimize the spacings therebetween.

4,963,842

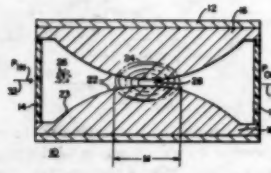
MILLIMETER WAVE FIN-LINE GAS DISCHARGE RECEIVER PROTECTOR

Sumantrai D. Patel, Silver Spring, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 286,399, Dec. 19, 1988, abandoned. This application Mar. 5, 1990, Ser. No. 490,537

Int. Cl.[5] H01P *1/14*

U.S. Cl. 333—13 **39 Claims**



1. A millimeter wave, fin-line, radar receiver protector, comprising:

a hermetically sealed, rectangular housing, said rectangular housing having four sides and a first and a second end;

first and second dielectric windows fixedly mounted at said first and said second ends of said housing, respectively said first and said second dielectric windows being operable to receive radio frequency signals, and transmit said radio frequency signals through said millimeter wave, fin-line, radar receiver protector;

a radioactive primer, mounted within said rectangular housing, said radioactive primer being operable to emit free electrons within said housing;

an inert gas contained within said hermetically sealed, rectangular housing, said inert gas operable to be excited by said free electrons emitted from said radioactive primer, and said radio frequency signals; and,

first and second bevelled, fin-line tapered fins mounted within said housing, said first fin mounted onto one of said sides of said housing and said second fin mounted onto an opposing side of said housing, such that said first fin and said second fin are parallel and directly opposed to one another forming a discharge gap, said first and said second fins are bevelled their entire length, said discharge gap being operable to facilitate a gas discharge across said discharge gap when said radio frequency signals enter said millimeter wave, fin-line, radar receiver protector, and whereby said radio frequency signals are attenuated.

4,963,843

STRIPLINE FILTER WITH COMBLINE RESONATORS

David S. Peckham, Barrington Hills, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 31, 1988, Ser. No. 265,151

Int. Cl.[5] H01P *1/203, 1/205*

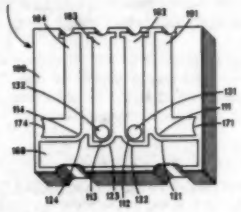
U.S. Cl. 333—203 **8 Claims**

1. A stripline filter for filtering a radio signal from a signal source, comprising:

a substrate having top and bottom surfaces, each surface with a conductive material thereon forming a respective ground plane, and said substrate further having an inner circuitry layer including:

a ground area comprised of a conductive material, having a plurality of angled edges, and coupled to at least one of said ground planes; and

at least two combline resonators, each resonator being comprised of a strip of conductive material, said strips being substantially parallel to one another, each strip having adjacent first ends coupled to at least one of said ground planes and having adjacent second ends capacitively coupled to said ground area, each of said adjacent second ends further having at least one angled edge disposed opposite a corresponding angled edge of said ground area, said strips each further having a respective extension portion at said second ends disposed substantially at right angles to



said parallel strips, said extension portions each further having a respective edge disposed opposite and capacitively coupled to said ground area, and one of said extension portions being coupled to the radio signal.

4,963,844

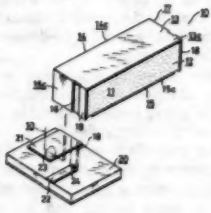
DIELECTRIC WAVEGUIDE-TYPE FILTER

Yoshihiro Konishi, Sagamihara; Kenichi Konno, Machida; Ikuo Awai, Ichikawa, and Hideo Hikuma, Ichikawa, all of Japan, assignors to Uniden Corporation, Ichikawa, Japan

Continuation-in-part of Ser. No. 293,665, Jan. 5, 1989, abandoned. This application Sep. 12, 1989, Ser. No. 406,313

Int. Cl.[5] H01P *1/207, 3/16*

U.S. Cl. 333—208 **23 Claims**



1. A dielectric waveguide-type filter comprising

a dielectric block that is long in an axial direction lying perpendicular to its width and height,

conductive layers provided on three of four surfaces extending in the lengthwise direction of said dielectric block, the fourth surface being left as an open surface, and

a pair of electrode patterns formed by patterning of conductive material on the dielectric block, one of said patterns serving as an input terminal for microwaves and the other thereof serving as an output terminal for microwaves,

whereby high-pass characteristics are obtained between the pair of electrode patterns.

4,963,845

SYNTHESIS OF ELECTRICAL IMPEDANCES

Robert L. Collier, 305 W. 20th, Austin, Tex. 78705

Filed Mar. 29, 1989, Ser. No. 329,946

Int. Cl.[5] H03H *11/48*

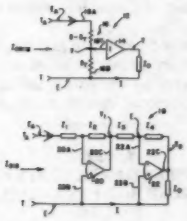
U.S. Cl. 333—214 **5 Claims**

1. A network for simulating an impedance having a passive source terminal and an autonomous source terminal for coupling a passive source potential to an autonomous source potential, respectively, said network comprising, in combination:

a potentiometer having a maximum resistance value R connected across said passive source terminal and said autonomous source terminal, said potentiometer having a di-

vider tap dividing said potentiometer into a first section having a resistance value R_T and a second section having a resistance value $R-R_T$, thereby defining a voltage divider circuit;

a unity gain voltage follower amplifier having an input



terminal and an output terminal, the input terminal of said voltage follower amplifier being connected to the divider tap of said potentiometer; and

an impedance Z_0 being coupled between the output terminal of said voltage follower amplifier and said passive source terminal.

4,963,846

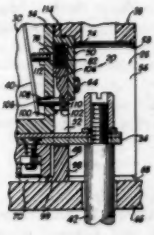
TRIP INTERLOCK DESIGN

Kurt A. Grunert, Beaver; Ronald A. Cheski, Stowe Township, Allegheny County; Robert J. Tedesco, Coraopolis; Michael J. Whipple, New Sewickley; Melvin A. Carrodus, Brighton Township, Beaver County, and James G. Maloney, Industry, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 4, 1989, Ser. No. 389,849

Int. Cl.[5] H01H *75/10*

U.S. Cl. 335—42 **19 Claims**



1. A circuit breaker comprising:

a housing adapted to be mounted to a panel;

one or more pairs of separable main contacts carried by said housing;

an operating mechanism, operatively coupled to said one or more pairs of separable main contacts;

one or more pairs of electrical terminals, electrically connected to said one or more pairs of separable main contacts disposed outwardly of said housing;

tripping means for tripping said circuit breaker, operatively coupled to said operating mechanism;

a trip pin which cooperates with said tripping means to cause said one or more pairs of separable contacts to be opened when said trip in is actuated; and

means for actuating said tripping means as said housing is moved away from said panel, wherein said actuating means includes an actuation arm housing, an actuation arm, a drive spring for biasing said actuation arm outwardly from said actuation arm housing and stop means for limiting the movement of said actuation arm with respect to said actuation arm housing.

4,963,847

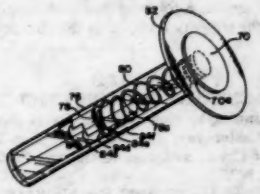
CIRCUIT BREAKER WITH TRANSPARENT TUBE MAGNETIC CORE HOLDER

Paul S. Cambreleng, Lambertville, and George W. Ford, III, Lawrenceville, both of N.J., assignors to Heinemann Electric Company, Lawrenceville, N.J.

Filed Apr. 11, 1989, Ser. No. 336,110

Int. Cl.[5] H01H *7/02*

U.S. Cl. 335—59 **12 Claims**



1. In a circuit breaker comprising switch contacts connected to terminals and connectable into a protected circuit and a winding in circuit between a terminal and a contact, including a switch handle, which enables at least the closing of the switch contacts and a mechanism for opening the contacts on overload including,

a non-magnetic tube within the winding containing a solid core of magnetic material movable within the tube in a viscous liquid, the core being biased away from a pole piece at one end of the tube, the tube being oriented relative to the winding so that the core is urged by the magnetic field of the winding toward the pole when subject to overload current and

a movable armature forming part of the mechanism, movement of which armature will open the closed contacts, whereby upon sustained overload the core moves toward the pole piece and when positioned sufficiently close to the pole piece will exert sufficient magnetic force on the armature to open the switch contacts,

the improvement comprising making at least the tube side walls of material through which the level of the viscous liquid in the tube may be visibly checked.

4,963,848

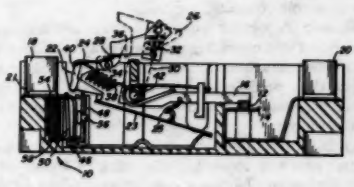
NON-JAMMING MAGNETIC TRIP STRUCTURE

Nell R. Palmer, and Paul Rustebakke, both of Swisher, Iowa, assignors to Square D Company, Palatine, Ill.

Filed Mar. 31, 1989, Ser. No. 331,976

Int. Cl.[5] H01H *9/00*

U.S. Cl. 335—172 **33 Claims**



1. An electromagnetic trip assembly for actuating a tripping function in a circuit breaker, said assembly comprising:

a housing;

an armature movably supported in said housing for movement from a first position toward a second position;

a compressible bias member supported within said housing for biasing the armature in said first position;

electromagnetic means, disposed near said armature, for providing an electromagnetic field in response to an overload level of current through a circuit in said circuit breaker which compresses said compressible bias member and moves said armature from said first position toward said second position; and

tripping means including a tripping member which is supported adjacent to said armature in said housing such that said armature, in response to being drawn from said first position, applies a force against said tripping member to actuate the tripping function in the circuit breaker.

4,963,849

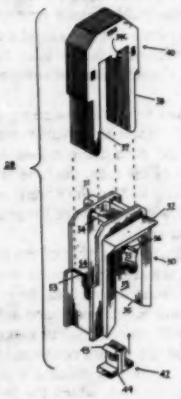
COMPACT CURRENT LIMITING CIRCUIT BREAKER

Karen B. Kowalczyk, New Britain; David Arnold, Chester; Roger N. Castonguay, Terryville, and Yuet-Ying Yu, Danbury, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Apr. 28, 1989, Ser. No. 344,936

Int. Cl.[5] H01H *9/30*

U.S. Cl. 335—201 **16 Claims**



1. A current limiting circuit breaker comprising:

a molded plastic case and cover arranged in a predetermined plane;

a pair of separable contacts within said case controlled by an operating mechanism;

a movable contact arm supporting one of said contacts and arranged for driving said one contact to an open position upon the occurrence of a short-circuit condition through said separable contacts;

an electronic trip circuit within said cover and arranged for articulating said operating mechanism upon occurrence of overcurrent conditions through said separable contacts longer than predetermined time periods to cause said movable contact and said one contact to move to their open positions;

a magnetic drive device arranged about said movable contact arm and consisting of a stack of U-shaped magnetic laminations having means integrally-formed therein for automatically aligning each of said laminations within said stack, said aligning means comprising a plurality of projections on one surface of each of said laminations and a corresponding plurality of depressions on an opposite surface thereof whereby one of said projections on one of said laminations is received within one of said depressions on another of said laminations;

a plastic support comprising a U-shaped member having a pair of depending legs joined by a bight and including a pocket formed outboard each of said support legs flexibly retaining said laminations on said support, said laminations comprising a pair of planar legs joined by a planar bight; and

an arc chute arranged proximate said magnetic drive device for receiving an arc generated when said contacts become separated and cooling and extinguishing said arc to completely interrupt circuit current through said contacts.

4,963,850

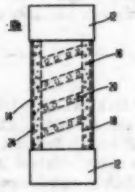
THERMAL WITHSTAND CAPABILITY OF A FILAMENT WOUND EPOXY FUSE BODY IN A CURRENT-LIMITING FUSE

Radhakrishnan Ranjan, Hickory, and William E. Lazenby, Statesville, both of N.C., assignors to General Electric Company, Malvern, Pa.

Filed Mar. 30, 1989, Ser. No. 330,630

Int. Cl.[5] H01H *85/143, 85/38*

U.S. Cl. 337—246 **13 Claims**



1. A device for enclosing a fuse element of a current-limiting fuse wherein thermal energy and hot gases are generated during triggering of said fuse element comprising, a fuse body and a protective shield adapted to resist the high temperature of said thermal energy without thermal breakdown, said shield separate from said fuse body and surrounding without enclosing said fuse element for protecting the inner surface of said fuse body from burning due to said generated thermal energy only by shielding said fuse body from said thermal energy wherein said high temperature resistant protective shield is adapted to permit escape of said hot gases from within said shield.

4,963,851

TEMPERATURE SENSOR

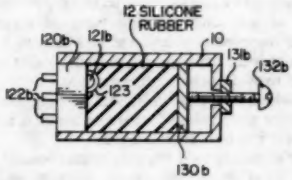
Teruo Okano, Hoajo, and Tomomi Nagata, Tokyo, both of Japan, assignors to Nibex Co., Ltd., Tokyo, Japan

Division of Ser. No. 72,206, Jul. 10, 1987, Pat. No. 4,893,945. This application Sep. 9, 1988, Ser. No. 242,384

Claims priority, application Japan, Jul. 11, 1986, 62-1090; Dec. 2, 1986, 61-185044; Dec. 27, 1986, 61-199832

Int. Cl.[5] G01K *05/48;* H01H *37/46*

U.S. Cl. 337—395 **7 Claims**



1. A temperature sensing element comprising: a tubular heat

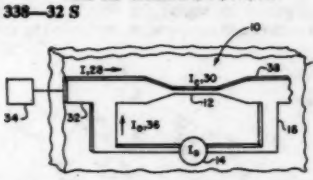
conductive case; a heat conductive base plate fixed to one end of a chamber of said case; silicone rubber means supported by said base plate, said silicone rubber means having a positive coefficient of thermal expansion and expansion and contraction characteristics which are linear with respect to changes in temperature; and a microswitch fixed to the other end of said chamber in said case and having an actuator located within the range of expansion of said silicone rubber.

4,963,852

SUPERCONDUCTOR SWITCH

Alvin J. Drehman, Chelmsford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 15, 1989, Ser. No. 323,636
Int. Cl.[5] H01L *29/00, 39/00*
U.S. Cl. 338—32 S 4 Claims



1. A current controlled superconducting switch, said current controlled superconducting switch comprising,

means for supporting, said means for supporting being an insulating material;

an input, said input connected to a device for providing an input current and having a voltage limit, said input being a superconducting material, a current I from the device flowing through said input when said switch is "on", and a substantially reduced current flowing through said input when said switch if "off";

a current controlling constriction, being a non-weak link, said constriction being superconducting when a current flowing therethrough is less than the critical current of said constriction, and non-superconducting when the current flowing exceeds the critical current;

a means for inputting a control current, said means being superconducting, said means being connected to said input, said control current and said input current from said device flowing through said constriction, and

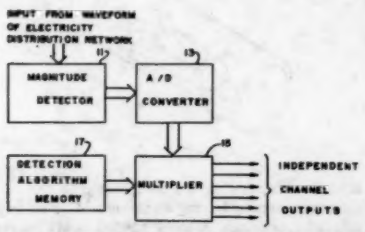
an output, said output being superconducting, said output connected to said constriction, said means for inputting and said output being supported by said means for supporting.

4,963,853

SIMULTANEOUS INBOUND MULTI-CHANNEL COMMUNICATION SYSTEM USING ELECTRICITY DISTRIBUTION NETWORK

Sioe T. Mak, Chesterfield, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 16, 1989, Ser. No. 421,794
Int. Cl.[5] H04M *11/04*
U.S. Cl. 340—310 A 20 Claims



1. A system for simultaneously transmitting signals composed of binary digits inbound over an electricity distribution network and for detecting said simultaneously transmitted inbound signals, each binary digit being composed of a first predetermined number of current pulses superimposed on preselected zero crossings contained within said first predetermined number of cycles of the voltage waveform of the electricity distribution network, comprising:

designating a second predetermined number of channels, said second predetermined number being at least fifty percent greater than the first predetermined number, each channel being defined by specifying the set of zero crossings which define a binary "1" for that channel and the set of zero crossings which define a binary "0" for that channel, said sets for each channel being mutually exclusive and each containing the first predetermined number of zero crossings, each set being unique with respect to all the other sets for the various channels;

sending binary digits inbound simultaneously over the second predetermined number of channels;

for the first predetermined number of cycles of the voltage waveform, measuring the magnitudes of the current pulses at all the zero crossings;

for each channel, applying a detection algorithm to the measured magnitudes of the current pulses for all the zero crossings, each detection algorithm being unique with respect to all the other detection algorithms, the detection algorithms being selected so that all the designated channels are non-interfering even though all use exactly the same zero crossings of the voltage waveform;

detecting a binary "1" for any particular channel if the application of the detection algorithm for that channel to the measured magnitudes of the current pulses for all the zero crossings equals a third predetermined number;

detecting a binary "0" for any particular channel if the application of the detection algorithm for that channel to the measured magnitudes of the current pulses for all the zero crossings equals the negative of the third predetermined number; and

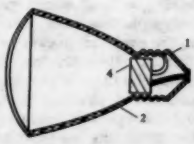
detecting the absence of a binary digit for any particular channel if the application of the detection algorithm for that channel to the measured magnitudes of the current pulses for all the zero crossings equals a number other than the third predetermined number or its negative.

4,963,854

LIGHT BULB SHAPED AUDIO SIGNAL EMITTER

Barry M. Stuecker, 5225 E. Taylor, Phoenix, Ariz. 85008

Filed Aug. 8, 1989, Ser. No. 390,824
Int. Cl.[5] G10K *9/00*
U.S. Cl. 340—384 E 6 Claims



1. An audible alarm device comprising:

a housing having a central axis about which a threaded exterior end portion of electrically conductive material extends, the threads being sized to fit in a threaded electrical socket normally used for electrical lamps and there being a central terminal element that is insulated from said threaded exterior;

said housing having an interior throat section of reduced size which extends forwardly of the threaded exterior end and a forward portion, which radially expands along the central axis to provide acoustical frequency amplification and which terminates in an open forward end; and

an audible frequency generator positioned in said reduced size throat and electrically connected directly to the threaded exterior and to the central terminal whereby the presence merely of an operating voltage in said electrical

socket will cause generator produced audio frequency energy that is transmitted by the interior throat section of the forward portion of the housing.

4,963,855

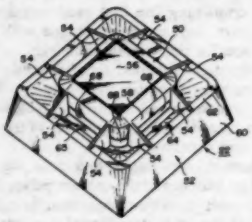
WARNING SOUND GENERATING DEVICE

Yoshikazu Kojima, Urawa, all of Japan, assignor to Kobishi Electric Co., Inc. Ltd., Tokyo, Japan

Filed Feb. 21, 1990, Ser. No. 483,258

Int. Cl.[5] G08B *13/00*

U.S. Cl. 340—391 **5 Claims**



1. A warning sound generating device comprising:

a sound-source-member for generating a warning sound, the sound-source-member having a planar base plate and at least a sound-source-member continuous projecting wall extending from a surface of the base plate, said sound-source-member projecting wall having a forward rim, and said planar base plate having a sound emitting portion surrounded by said sound-source-member projecting wall; and

an enclosure means secured to the sound-source-member for containing and protecting said sound-source-member, the enclosure means including a front wall having an inner surface facing generally parallel to said surface of said planar base plate from which said sound-source-member projecting wall extends, the enclosure means being spaced apart from said forward rim of the sound-source-member projecting wall of the sound-source-member, the enclosure means further including at least a continuous enclosure projecting wall extending from said surface of the front wall toward said base plate of the sound-source-member, said enclosure projecting wall having a rearward rim spaced apart from the base plate, said enclosure projecting wall being disposed outward of said sound-source-member projecting wall and spaced apart from said sound-source-member projecting wall so as to form a space therebetween, the enclosure means having a plurality of sound exits formed outwardly from said enclosure projecting wall, whereby there is provided a sound passageway from said sound emitting portion of the sound-source-member through said space between said sound-source-member projecting wall and enclosure projecting wall to said sound exits.

4,963,856

THEFT DETERRENT SYSTEM

Kazuo Yukitomo, Fukuyama, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 176,478, Apr. 1, 1988, abandoned. This application Sep. 22, 1989, Ser. No. 412,330

Claims priority, application Japan, Apr. 3, 1987, 62-83424; Apr. 27, 1987, 62-105882

Int. Cl.[5] B60R *25/10*

U.S. Cl. 340—426 **19 Claims**

1. A theft deterent system, comprising:

a vehicle having a plurality of opening and closing parts attached thereto, said plurality of opening and closing parts being able to be locked and unlocked, and being divided into a first group of one or more opening and closing parts and a second group of one or more opening and closing parts;

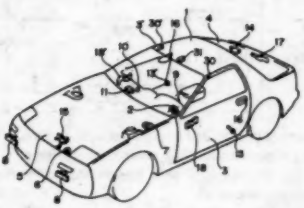
alarm means for outputting an alarm exteriorly of the vehicle;

open/closed state sensing means for sensing individual open and closed states of each of said plurality of opening and closed states of each of said opening and closing parts and outputting signals indicative of the states sensed,

said open/closed state sensing means including detecting means coupled to some of said opening and closing parts for detecting that at least one of the opening and closing parts in the second group has been unlocked from the exterior of the vehicle by the driver;

means for sensing that an ignition signal for starting an engine of the vehicle has been generated;

first setting means for setting the vehicle to a first armed phase in response to an operation performed by the driver;



first actuating means for actuating said alarm means in response to at least one signal sensed during the first armed phase, from among a group of possible signals including (a) said ignition signal and (b) the signals indicative of the open states of said plurality of opening and closing parts;

second setting means for setting the vehicle from the first armed phase to a second armed phase in response to an unlocking operation detected by said detecting means during the first armed phase; and

second actuating means for actuating said alarm means in the second armed phase in response to at least one signal, sensed during the second armed phase, from among said group of possible signals, including (a) said ignition signal and (b) the signals indicative of the open states of said opening and closing parts belonging solely to the first group.

4,963,857

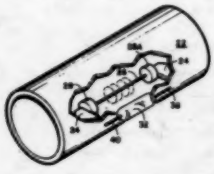
TRANSLATABLE DUAL MAGNETS

Robert L. Sackett, 4943 Mt. Durbin Dr., San Diego, Calif. 92117

Filed Jun. 26, 1989, Ser. No. 371,070

Int. Cl.[5] G08B *21/00*

U.S. Cl. 340—606 **13 Claims**



1. A fluid flow sensing device comprising:

A non-ferrous housing having an inside and outside surface;

two normally coaxially aligned spaced apart magnets of substantially the same dimensions each having a central bore, said magnets being separated by the influence of

adjacent like poles and translatable within said housing by the flow of fluid through said housing;

a magnet support shaft carried by said housing on the inside surface thereof, said shaft is secured to said housing at least on one end and has a diameter slightly less than said bore, said magnets are supported thereby and are linearly translatable relative to said housing;

a magnet translation detection means; and

a positioning means for supporting said magnet translation detection mans, said positioning means carried by said housing on the outside surface thereof and positionable relative thereto for positioning said magnet translation detection means at a location along said housing relative to a translatable position of either of said magnets depending on the direction of fluid flow whereby when fluid flows in said housing of at least one of said magnets is translated and one of said magnets will have influence on said magnet translation detection means and the other magnet being out of the position of influence of said magnet translation detection means in the direction of flow.

4,963,858

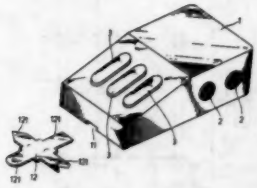
CHANGEABLE INPUT RATIO MOUSE

Fong K. Chien, 3F-2 No. 3, Alley 6, Lane 118, Sec. 1, Chung Yand Road, Tu Cheng Hsiang, Taipei Hsien, Taiwan

Continuation of Ser. No. 94,409, Sep. 8, 1987, abandoned. This application Aug. 7, 1989, Ser. No. 390,044

Int. Cl.[5] G09G *1/00*

U.S. Cl. 340—710 **1 Claim**



1. A coordinate-data input device for use by an operator for tracing an image and supplying coordinate data of the traced image, comprising:

a housing having a groove in a side thereof;

detecting means for measuring sliding distances in two coordinates of said housing over a surface in contact with said housing;

manually activated switch means;

processing means for supplying a stream of coordinate pair data in response to said measured sliding distances at least one of which is selectively multiplied by a predetermined constant in response to activation of said manually activated switch means; and

an interchangeable ordinate plate having on an end thereof a plurality of radial arms each having a different shaped pointer, each arm adapted to slidably engage said groove of said housing and located so that another arm of said ordinate plate is positioned to enable said operator to trace said image.

4,963,859

METHOD AND APPARATUS FOR CAPTURING INFORMATION IN DRAWING OR WRITING

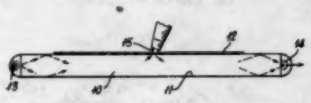
John R. Parks, Ringwood, England, assignor to National Research Development Corporation, London, England

Filed Jan. 29, 1988, Ser. No. 150,249

Claims priority, application United Kingdom, Feb. 2, 1987, 8702302

Int. Cl.[5] G09G *1/00*

U.S. Cl. 340—712 **24 Claims**



1. A method of obtaining information as writing or drawing is carried out, comprising the steps of:

writing or drawing on a surface which is arranged to vary the intimacy of contact at an interface between a flexible sheet and transparent (or translucent) material, using a tip of an instrument which contacts the surface, the interface having marks spread across a region where use of the writing instrument affects the said intimacy of contact,

supplying light to one side of the interface, and

sensing variations in light internally reflected at the interface, due to the presence of the marks, as the intimacy of contact is changed by the tip when writing or drawing is being carried out.

4,963,860

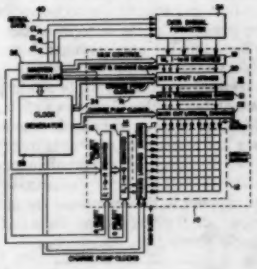
INTEGRATED MATRIX DISPLAY CIRCUITRY

Roger G. Stewart, Neshanic Station, N.J., assignor to General Electric Company, Princeton, N.J.

Filed Feb. 1, 1988, Ser. No. 150,812

Int. Cl.[5] G09G *3/20*

U.S. Cl. 340—719 **14 Claims**



1. Commutating circuitry integrated on a display device for commutating input signal to a plurality of busses of said display device including a plurality of transistors coupled to an input terminal for applying said input signal and responsive to control signals applied to control terminals for selectively coupling said input signal to respective ones of a plurality of latch circuits, including means for biasing said latch circuits during said selective coupling of said input signal respectively thereto, to exhibit a loss in signal power between said input terminal and an output terminal of said respective latch circuit and to enhance the speed with which said input signal coupled via said transistors to said latch circuits, establishes the states of said latch circuits, and means coupled to said plurality of latch circuits for applying potentials to ones of said plurality of busses.

4,963,861

ELECTROLUMINESCENT MEMORY DISPLAY HAVING MULTI-PHASE SUSTAINING VOLTAGES

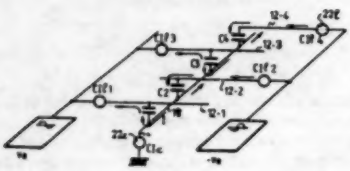
Pascal Thioulouse, Paris, and Jean-Pierre Budin, L'Hay-Les-Roses, both of France, assignors to Etat Francais represente par le Ministre des Postes et Telecommunications Centre National, Issy les Moulineaux, France

Continuation of Ser. No. 136,805, Dec. 22, 1987, abandoned. This application Jan. 11, 1990, Ser. No. 464,650

Claims priority, application France, Dec. 22, 1986, 86 17985

Int. Cl.[5] G09G *3/30*

U.S. Cl. 340—781 **13 Claims**



1. A memory effect electroluminescent display comprising:

a first set of parallel electrode members;

a second set of parallel electrode members, orthogonal to those of the first set;

at least one layer having a memory effect electro-optical property and enclosed between said first and second sets of electrode members;

each particular electrode member of said first set crossing each particular electrode member of said second set at an overlap zone defining a particular pixel of said display;

AC sustain voltage generator means having a first terminal for coupling a first potential to the electrode members of said first set and a second terminal for coupling a second potential to the electrode members of said second set, so as to apply permanently therebetween an AC voltage for sustaining a present condition of said pixels;

means for selectively altering the AC voltage between certain of the first and second electrode members, so as to change the condition of the corresponding pixels;

said display including the improvement that;

said AC sustain voltage generator means has at least two first terminals respectively delivering two first potentials mutually phase-shifted with reference to each other;

at least said first set of electrode members is subdivided into at least two first sub-sets of electrode members; and

said at least two first terminals are simultaneously coupled to at least said two first sub-sets of electrode members, respectively, in order to reduce at least the currents flowing in said second set of electrode members and in said means for selectively altering the AC voltage.

4,963,862

TERMINAL EQUIPMENT IDENTIFIER CONTROL CIRCUIT

Takeo Nakabayashi, and Hirohisa Machida, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 216,915

Claims priority, application Japan, Jan. 7, 1988, 63-1495

Int. Cl.[5] H04J *3/24*; H04Q *11/00*

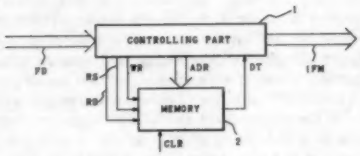
U.S. Cl. 340—825.52 **12 Claims**

1. A terminal identifier control circuit in a communications apparatus for identifying a terminal unit, coupled to a network, by means of terminal identifiers, comprising:

a memory, coupled to the terminal unit, having a number of address storage locations at least equal to a total number of the terminal identifiers to be assigned;

means, coupled to said memory, for resetting said address storage locations of said memory to a first value representing an unassigned status;

an address means, coupled to said memory, for giving said memory a terminal identifier as an address signal when assigning said terminal identifier to a terminal unit and for writing a second value, representing an assigned status, to said corresponding address of the memory;



means, coupled to said memory, for detecting a condition when address storage locations of said memory have been written with said second value; and

means, coupled to said memory and to said detecting means, for setting a check procedure starting signal when all of said address storage locations are detected as being written with said second value.

4,963,863

BROADBAND SIGNAL SWITCHING EQUIPMENT

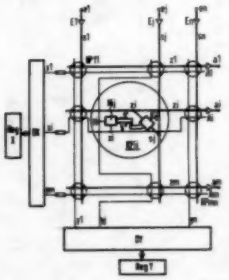
Raediger Hofmann, Gilching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 14, 1988, Ser. No. 258,020

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1987, 3734824

Int. Cl.[5] H04Q *3/00*

U.S. Cl. 340—825.880 **9 Claims**



1. A broadband signal switching equipment having a crosspoint matrix using FET technology devices whose switching elements are controlled by crosspoint-associated storage memory cells (Hij) driven in two coordinates each of which is formed by two cross-coupled MOS inverter circuits (Tnl', Tnt'; Tnl'') wherein one of the inverter circuits (Tnl', Tnt') has its input side connected via a first selection transistor (Tnh') to a selection line (xi) that carries a non-inverted selection signal of one selection direction and wherein the other of the inverter circuits (Tnl'', Tnt'') has its input side connected via a selection transistor (Tnh'') to a selection line i)/ that carries an inverted selection signal of the same selection direction, both selection transistors (Tnh', Tnh'') receiving on their control electrodes a selection signal of the other selection direction, comprising control electrodes of two load transistors (Tnl'; Tnl'') of the two cross-coupled inverter circuits being connected to a selec-

tion line j)/ that carries an inverted selection clock signal of the other selection direction.

4,963,864

APPARATUS FOR DISPLAYING TRAVEL PATH

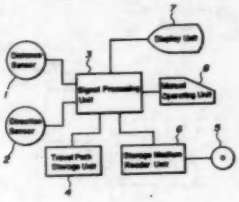
Akira Iihoshi; Yukinobu Nakamura; Yoshiyuki Matsumoto, and Tomoyuki Nishio, all of Chuo Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 224,985

Claims priority, application Japan, Aug. 7, 1987, 62-198630; Aug. 7, 1987, 62-198631; Aug. 7, 1987, 62-198632; Aug. 7, 1987, 62-198633; Aug. 7, 1987, 62-198634

Int. Cl.[5] G06F *15/50*

U.S. Cl. 340—995 4 Claims



1. An apparatus for displaying the travel path of a moving body wherein the current position of the moving body is cumulatively calculated and sequentially renewed on a road map displaying road patterns on a screen by arithmetically processing estimated current positions of the moving body in terms of X- and Y- coordinates while measuring the moving body's running distance and detecting its direction of travel and sequentially storing the X- and Y- coordinates of the estimated current positions, the running distance and the direction of travel in a memory, characterized in that it comprises:

first processing means for automatically setting a presumed current position corresponding to an estimated current position on the road map each time the moving body runs a predetermined running distance, the presumed current position being set at a predetermined distance interval on each road on which the moving body is supposed to run, with reference to X- and Y- coordinates of the road patterns, the X- and Y- coordinates of the road patterns being previously stored in a memory;

second processing means for determining, each time the moving body runs the predetermined running distance, whether an angle between a vector extending in the direction in which the moving body travels as it leaves the last estimated current position of the moving body and a vector extending in the direction in which the road extends from the selected presumably current position on the road is within a predetermined angle range and, when such determination is in the affirmative, selecting a road pattern having the presumed current position thereon as a selected road pattern;

third processing means for arithmetically processing a pattern-matching of the selected road pattern and a travel trace extending from the last estimated current position retrieved from the memory; and

fourth processing means for correcting the travel trace of the moving body so that it coincides with the road pattern to which the pattern-matching between the travel trace and the selected road pattern of the moving body has been effected,

wherein the moving body's angle of travel is successively determined each time the moving body has moved a predetermined running distance and, each time the added values of the respective angles thus determined becomes larger than a predetermined value, a pattern matching is collectively carried out between the moving body's travel trace during the period when the moving body's angles of travel are successively determined and have been added together, and the selected road pattern on the map extending from the resumed current position selected in correspondence to the current position of the moving body through a plurality of presumed current positions thus far selected.

4,963,865

APPARATUS FOR DISPLAYING TRAVEL PATH

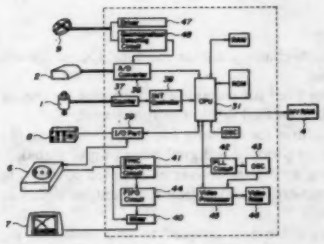
Akira Ichikawa; Akira Iihoshi; Yukinobu Nakamura, and Shinichiro Yasui, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1987, Ser. No. 25,848

Claims priority, application Japan, Mar. 14, 1986, 61-057944; Mar. 14, 1986, 61-057946; Mar. 14, 1986, 61-057943

Int. Cl.[5] G06F *15/50*

U.S. Cl. 340—995 4 Claims



1. An apparatus for displaying a travel path of a running body in which a constantly changing location of the running body on two-dimensional coordinates is successively computed and the current location of the running body is displayed successively, in accordance with the data thus computed, on a display screen having a map previously displayed thereon, comprising:

means for registering as known factors longitude and latitude values of reference points, each of which is formed by an intersection point of a mesh consisting of lines of longitude and latitude on the map, the map having divided areas;

means for converting the current location of the running body on the two-dimesional coordinates to a position on latitude-longitude coordinates;

means for calculating the current location on the map, on the basis of the known latitude-longitude values of a reference point on the map displayed on the display screen; and

means for displaying the current location on the display screen,

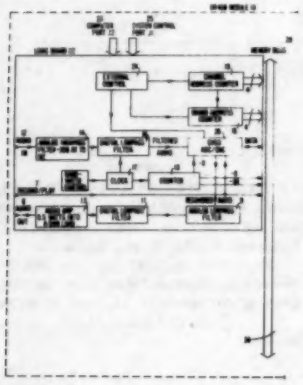
wherein the latitude-longitude of a position of a target point set on a map displayed on the display screen is calculated from the reference point of the map and means is provided to obtain and display a distance between the current location of the running body and the target point from a difference in position between latitude-longitude coordinates of the current location of the running body displayed on the map of one area and of the target point displayed on the map of another area.

4,963,866

MULTI CHANNEL DIGITAL RANDOM ACCESS RECORDER-PLAYER

Virgil D. Duncan, Raleigh, N.C., assignor to Digital Recorders, Inc., Research Triangle Park, N.C.

Filed Mar. 27, 1989, Ser. No. 328,863
Int. Cl.[5] H03M 3/00
U.S. Cl. 341—110 **17 Claims**



1. A multi-channel digital random access recorder-player comprising:

an analog filter for receiving and filtering an analog signal to produce an analog filter output signal;

a digital filter for digitally filtering said analog filter output signal to produce a digital filter output signal;

an analog to digital converter coupled to said digital filter for converting said digital filter output signal to a digital signal;

logic control means coupled to said analog to digital converter for controlling said recorder-player;

clocking means coupled to said logic control means for generating at least one clocking frequency signal;

memory means coupled to said logic control means having a plurality of channels, each of said channels having a plurality of memory boards for storing data;

addressing means coupled to said memory means for assigning a unique binary address to each of said channels and to each of said memory boards of said memory means;

external control means coupled to said logic control means for selecting one of a record mode and a playback mode of operation for said recorder-player and for selecting binary address corresponding to a selected one of said binary addresses of said channels and for selecting a binary address corresponding to a selected one of said binary addresses of said memory boards;

comparator means for comparing said binary address selected by said external control means with each one of said binary addresses of said channels and with each one of said binary addresses of said memory boards, such that the one of said binary addresses of said channels corresponding to said binary address of said channel selected by said external control is detected and such that the one of said binary addresses of said memory boards corresponding to said binary address of said memory board selected by said external control is detected; and

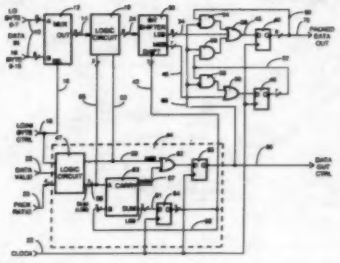
memory enabling means coupled to said memory means and to said logic control means for enabling said channel and said memory board having said addresses corresponding to said addresses of said channel and said memory board selected by said external control, such that data from said logic control is recorded in said enabled channel and memory board when said external control means selects said record mode of operation.

4,963,867

APPARATUS FOR PACKING PARALLEL DATA WORDS HAVING A VARIABLE WIDTH INTO PARALLEL DATA WORDS HAVING A FIXED WIDTH

Keith J. Bertrand, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 31, 1989, Ser. No. 331,977
Int. Cl.[5] H03M 7/44
U.S. Cl. 341—60 **9 Claims**



1. An apparatus for packing data, receiving parallel data words having a width equal to a variable number of n valid data bits, and providing parallel output data words having a width equal to a fixed number of m valid data bits, comprising:

a control circuit for receiving a signal corresponding to a binary representation of said number n for each received data word, said signal having a most significant bit (MSB) portion when n is equal to or greater than m, and a least significant bit (LSB) portion, corresponding to least significant bits of said number n, said MSB portion being applied by said control circuit as a first MSB control signal, said control circuit comprising an adder means;

said adder means receiving and summing subsequently received LSB portions of said signal to provide a running sum, and for providing a second MSB control signal corresponding to an MSB portion of said running sum when said running sum is equal to or greater than m, said adder means further providing a third control signal corresponding to an LSB portion of said running sum;

bit shifter means for receiving said third control signal, receiving and shifting said parallel data words by a number of bit positions corresponding to said third control signal; and

data output means for receiving and storing data bits from said bit shifter means in a received order, and for providing an m-bit wide packed parallel output word at an occurrence of one of said first and second MSB control signal.

4,963,868

FRAME SYNCHRONIZING METHOD AND SYSTEM

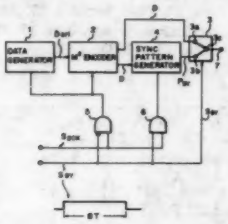
Jun Takayama, Tokyo; Katsuichi Tachi, Kanagawa; Hideto Suzuki, Kanagawa, and Kenshiro Masuzaki, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 10, 1988, Ser. No. 269,482
Claims priority, application Japan, Nov. 27, 1987, 62-299385
Int. Cl.[5] H03M 5/14
U.S. Cl. 341—72 **16 Claims**

1. A frame synchronizing method for generating encoded data having a frame synchronizing signal inserted in a data stream based on original data having a first logical bit state and a second logical bit state, said method comprising the steps of:

encoding said original data into a stream of M^2 coded data;

generating a frame synchronizing signal in response to said M^2 coded data so that said frame synchronizing signal has a unique pattern which does not appear in said M^2 coded data; and



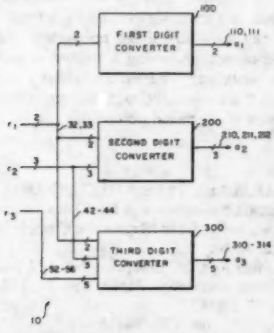
inserting said frame synchronizing signal into said M^2 coded data stream.

4,963,869

PARALLEL RESIDUE TO MIXED BASE CONVERTER

R. Aaron Falk, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1989, Ser. No. 414,474
Int. Cl.[5] H03M *7/18, 7/12*
U.S. Cl. 341—83 **17 Claims**



1. A parallel residue to mixed base converter for converting an input number, expressed in residue number system (RNS) representation as a plurality of residue digits, into an output number, expressed in mixed base number system representation as a plurality of mixed base digits, said parallel residue to mixed base converter comprising:

a plurality of digit converters arranged in parallel, each of said plurality of digit converters receiving at least one residue digit associated with at least one moduli of said RNS representation and outputting a mixed base digit;

each of said plurality of digit converters further comprising:

a plurality of sources grouped into residue groups, each residue group corresponding to a residue digit and arranged such that exactly one source within each residue group is activated at one time, said activated source indicative of the value of a residue digit associated with that residue group; and

a plurality of interconnects, each of said plurality of interconnects connected at one end to one of said plurality of sources and connected at another end to one of a plurality of detectors; each of said plurality of interconnects transmitting a signal to a connected detector when said connected source is activated;

each of said plurality of detectors being connected to at least one of said plurality of interconnects;

each of said plurality of detectors being set to trigger at trigger values upon receiving said signals and being grouped into mixed base groups such that each mixed base group corresponds to a value of a mixed based digit;

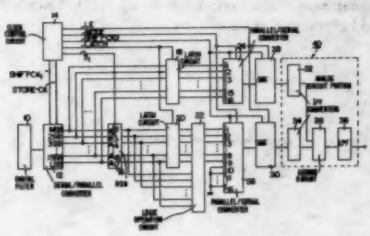
said trigger values selected and said interconnects arranged such that exactly one of said plurality of detectors within each digit converter triggers at any one instant and such that said exactly one of said plurality of detectors within each digit converter indicates an output value of a mixed base digit.

4,963,870

DIGITAL TO ANALOG CONVERTER WITH COMPENSATION MEMORY ADDRESSED BY LOWER ORDER BITS

Hajime Obinata, Tokyo, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

Filed Oct. 23, 1989, Ser. No. 425,572
Claims priority, application Japan, Oct. 27, 1988, 63-271889
Int. Cl.[5] H03M *1/06*
U.S. Cl. 341—118 **4 Claims**



1. A digital/analog converting device comprising:

a first digital/analog converter for converting upper M bits of an input digital signal into a first analog signal;

storage means for receiving, as address data, at least a digital signal of lower N bits of the input digital signal to output lower-bit-output-approximate data of S (S>N) bits in response to the address data;

a second digital/analog converter for converting digital data at least including the S-bit lower-bit output-approximate data into a second analog signal; and

analog adding means for adding the first analog signal to the second analog signal at a predetermined ratio to output an added analog signal,

the S-bit lower-bit-output-approximate data to be outputted in response to the digital signal of lower N bits being set such that, when a level change of the added analog signal with respect to a change of an LSB of the upper M bits is ΔL, a minimum step increase of the digital signal of lower N bits causes a level of the added analog signal to increase by about $\Delta L/2^n$.

4,963,871

ANALOG-TO-DIGITAL CONVERTER USING SUPERCONDUCTING MATERIAL

Nobuo Shiga, Kanagawa, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

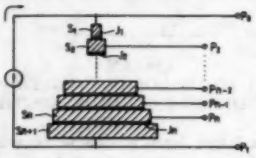
Filed Aug. 24, 1988, Ser. No. 235,940
Claims priority, application Japan, Aug. 25, 1987, 62-210708; Aug. 25, 1987, 62-210709; Aug. 25, 1987, 62-210710
Int. Cl.[5] H03M *1/12*
U.S. Cl. 341—133 **15 Claims**

1. An analog-to-digital converter, comprising:

a converter portion including a plurality of series-connected superconducting current channels for which different values of a certain critical condition are set, said critical condition being one of a critical current and a critical magnetic field, an analog signal being superimposed

thereon, said values differing from one another by a fixed amount, and

a detector portion including means for detecting the interruption of the flow of a superconducting current in each of said superconducting current channels, said analog-to-



digital converter outputting a digital signal in response to an associated change in the critical current or the magnetic field that results from the superposition of the analog signal, said critical condition being applied as an input to said converter portion.

4,963,872

METHOD AND ARRANGEMENT FOR GENERATING A MEAN-VALUE-FREE BINARY SIGNAL

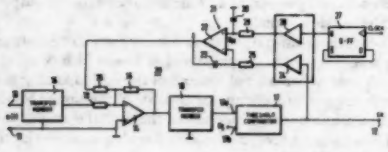
Georg Schneider, Schopfheim-Langenau; Günter Freudig, Karlsruhe; Fernand Rippinger, Karlsruhe, and Hans Braun, Karlsruhe, all of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

Filed Sep. 9, 1987, Ser. No. 94,821

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1986, 3633768

Int. Cl.[5] H03M *1/06*

U.S. Cl. 341—142 14 Claims



4. A circuit arrangement for generating a time-mean-value-free binary signal from an analog signal, comprising a binarizing circuit which receives the analog signal and which produces at an output a first binary signal obtained by binarizing the analog signal with respect to a binarizing threshold, a closed-loop control circuit connected to the output of said binarizing circuit, the closed-loop control circuit including a differential integrator which receives at a first input the first binary signal and at a second input a desired value signal generated by integrating a time-mean-value-free second binary signal having the same signal levels as the first binary signal, and means for shifting the level position of the analog signal relative to the binarizing threshold by means of the output signal of said differential integrator such that the voltage mean value of the deviation between the first binary signal and the desired value signal is regulated to zero.

4,963,873

DIGITAL/ANALOG CONVERTER WITH HIGH OUTPUT VOLTAGE STABILITY

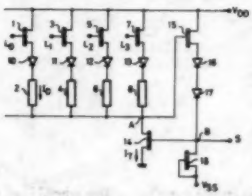
Pham N. Tung, Paris, France, assignor to Thomson Hybrides et Microondes, Paris, France

Filed Nov. 17, 1988, Ser. No. 272,432

Claims priority, application France, Nov. 17, 1987, 87 15846

Int. Cl.[5] H03M *1/80*

U.S. Cl. 341—153 5 Claims



1. A digital/analog converter with high output voltage stability, comprising a first stage, constituted by several loads controllable in parallel, which deliver currents in geometrical progression in a single current/voltage converting transistor, each controllable load being constituted by a transistor having a gate forming an input for a bit of a binary number, a drain powered by a positive voltage and a source connected, through a diode, to a saturable load which is itself connected to the drain of the current/voltage converting transistor, said digital/analog converter having a second stage which is an output voltage stabilizer, wherein the output voltage is applied to the gate of the current/voltage converting transistor, the source of which is at ground potential.

4,963,874

PARALLEL TYPE A/D CONVERTER

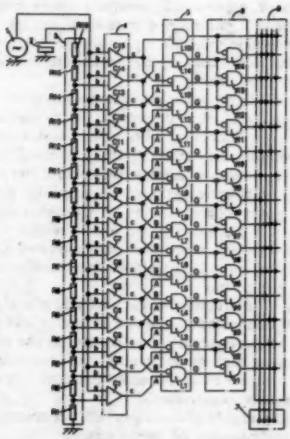
Akira Matsuzawa, Neyagawa, and Haruyasu Yamada, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 28, 1988, Ser. No. 187,642

Claims priority, application Japan, Apr. 28, 1987, 62-105138; Nov. 4, 1987, 62-278617

Int. Cl.[5] H03M *1/00*

U.S. Cl. 341—159 10 Claims



2. A parallel type A/D converter comprising:

a means for generating at least N reference voltages, wherein N is a positive integer;

a comparator chain comprising N comparator means, the n-th comparator means for comparing a voltage value of an input signal and the n-th reference voltage, and for outputting a logic signal in accordance with the thus compared voltage value of the input signal and n-th reference voltage, wherein n is a positive integer from 1 to N; and

a first logic chain comprising N first logic circuits, the n-th first logic circuit having as inputs the logic signal output from the n-th comparator means and the logic signal output from the (n+2)th comparator means.

4,963,875

DEVICE FOR CODING AN ANALOG IMAGE SIGNAL INTO A BINARY SIGNAL

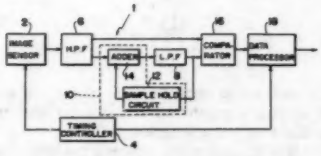
Yasuhumi Yatsuzuka, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 8, 1989, Ser. No. 307,529

Claims priority, application Japan, Feb. 9, 1988, 63-28429

Int. Cl.[5] H03M *1/38*

U.S. Cl. 341—164 **7 Claims**



1. A device for coding an analog image signal, obtained from an image sensor, into a binary image signal comprising:

low pass filter means for deriving a low frequency component signal from an added analog image signal and for integrating the derived low frequency component signal;

feed back circuit means for sampling and holding said integrated low frequency component signal derived from said low pass filter means for feeding back said sampled and held integrated low frequency component signal so as to add the sampled and held integrated low frequency component signal to the analog image signal to generate said added analog image signal; and

comparator means for coding the analog image signal into a binary image signal by comparing said integrated low frequency component signal and the analog image signal using said integrated low frequency component signal as a threshold signal of said comparator means.

4,963,876

THIN PROGRAMMABLE REMOTE CONTROL TRANSMITTER

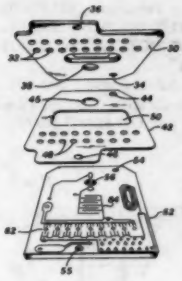
Rudy T. Sanders, 9520 Rhea Ave., Northridge, Calif. 91324, and Lee Fleishman, 2169 Brookfield Dr., Thousand Oaks, Calif. 91362

Filed Aug. 21, 1989, Ser. No. 398,371

Int. Cl.[5] G08C *17/00*

U.S. Cl. 341—176 **19 Claims**

1. A programmable transmitter for the transmission of remote control signals comprising a first non-conductive element having a conductive area thereon, a second non-conductive element having a plurality of removable areas thereon, and a third element comprising a printed circuit board having a plurality of contacts thereon, said contacts adapted to come into continuous electrical contact with said first element's conductive area only at those locations where the removable



areas are removed from said second element to program the transmitter.

4,963,877

SYNTHETIC APERTURE RADAR

James W. Wood; Christopher J. Oliver; Ian P. Finley, all of Worcester, and Richard G. White, Worcestershire, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

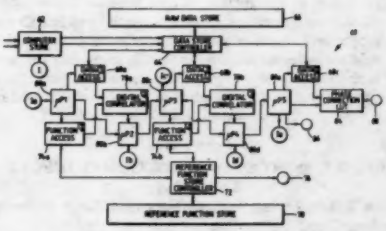
PCT No. PCT/GB88/00408, § 371 Date Dec. 5, 1989, § 102(e) Date Dec. 5, 1989, PCT Pub. No. WO88/10434, PCT Pub. Date Dec. 29, 1988

PCT Filed May 24, 1988, Ser. No. 435,478

Claims priority, application United Kingdom, Jun. 24, 1987, 8714746

Int. Cl.[5] G01S *9/02*

U.S. Cl. 342—25 **7 Claims**



1. A synthetic aperture radar system comprising:

(a) means for generating raw synthetic aperture radar data;

(b) means for

(i) processing the raw data on the basis of trial across-track platform accelerations to obtain successive estimates of that acceleration,

(ii) correcting the phase and range of the raw data in accordance with across-track position and velocity obtained from successive acceleration estimates, and

(iii) correlating phase-corrected raw data on the basis of reference functions selected in accordance with corrected range to provide image data; and

(c) means for storing and/or displaying the image data as a function of azimuth and corrected range.

4,963,878

REFLECTOR ANTENNA WITH A SELF-SUPPORTED FEED

Per-Simon Kildal, 2A Torplassen, 8018 Saupstad, Norway

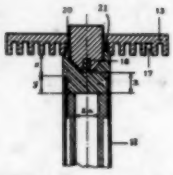
PCT No. PCT/NO87/00044, § 371 Date Mar. 7, 1988, § 102(e) Date Mar. 7, 1988, PCT Pub. No. WO87/07771, PCT Pub. Date Dec. 17, 1987

PCT Filed Jun. 3, 1987, Ser. No. 151,517

Claims priority, application Norway, Jun. 3, 1986, 861292

Int. Cl.[5] H01Q 19/19

U.S. Cl. 343—781 P 13 Claims



1. In an antenna system, a reflector and a feed element for radiating and intercepting electromagnetic waves, comprising:

(a) a main reflector, and

(b) a self-supported waveguide feed element located along the axis which passes through the center of said main reflector, said feed element including;

(1) a support-tube which has one end attached to the center of said main reflector and the other end located near the focal region of the reflector;

(2) a waveguide located inside said tube;

(3) a subreflector located outside the outer end of said tube and said waveguide, said subreflector having a diameter larger than said support-tube;

(4) a gap provided between said subreflector and the outer end of said tube, being externally bounded by an imaginary cylindrical aperture surface which has substantially the same diameter as the outer diameter of said tube;

(5) the part of said tube which is nearest to the gap having an outer surface which is mainly cylindrical with a circular cross-section; and

(6) the part of the surface of said subreflector which lies outside said aperture surface is planar and has an anisotropic and reactive surface impedance, and the part of said subreflector which lies within said aperture surface is shaped as a converging element which has reflecting characteristics and which is inclined towards said tube.

4,963,879

DOUBLE SKIRT OMNIDIRECTIONAL DIPOLE ANTENNA

Jonathan X. Lin, Dallas, Tex., assessor to Alliance Telecommunications Corp., Dallas, Tex.

Filed Jul. 31, 1989, Ser. No. 387,007

Int. Cl.[5] H01Q 9/20

U.S. Cl. 343—792 16 Claims

1. An omnidirectional antenna for operation over a band having a selected center frequency, comprising:

an electrically conductive, elongate mast,

a plurality of dipole radiators mounted at spaced apart positions along said mast, each dipole radiator comprising:

a first cylindrical radiator element having an end plate at a first end thereof, said end plate having a center bushing with an opening therein for receiving said mast wherein said first radiator element is supported by said mast through said end plate and bushing thereof,

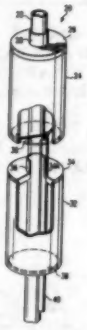
a second cylindrical radiator element having an end plate at a first end thereof, said second radiator element end plate having a center bushing with an opening therein for receiving said mast and facing a second end of said first radiator element wherein said second radiator element is supported by said mast through said end plate and bushing thereof,

the combined length and radius of each said radiator elements equal to approximately one quarter of the wavelength of said selected center frequency,

the ratio of the diameter of said mast to the diameter of each of said cylindrical radiating elements is less than 0.5,

said mast, said radiator elements and said end plates being DC electrically connected,

a feed line supported by said mast and having a conductor



thereof connected to opposite sides of each of said first radiator elements proximate said second end thereof, wherein said feed line comprises:

a primary feed line extending through the interior of said mast to an opening in said mast, said opening positioned at a midpoint of said plurality of dipole radiators mounted on said mast,

a secondary feed line positioned exterior to said mast, connected to said primary feed line at said opening, extending in opposite directions along said mast from said opening, and connected through said conductor to each of said first radiator elements.

4,963,880

COPLANAR SINGLE-COIL DUAL FUNCTION TRANSMIT AND RECEIVE ANTENNA FOR PROXIMATE SURVEILLANCE SYSTEM

John J. Torre, Monroe, N.Y., and Michael Drummy, Stanhope, N.J., assignors to Identitech, Essex, N.J.

Continuation of Ser. No. 189,861, May 3, 1988, abandoned. This application Feb. 23, 1989, Ser. No. 315,233

Int. Cl.[5] H01Q 7/00

U.S. Cl. 343—866 2 Claims

1. A single coil, dual function coplanar antenna system having transmit and receive intervals during which magnetic field components are transmitted and received, respectively, within a region proximate the antenna system, comprising:

(a) a single coil having a perimeter and enclosing a unique region;

(b) means for driving said coil during said transmit intervals to generate and transmit time varying magnetic field components within said proximate region, said coil upon being driven on, producing components vertical and horizontal

to the plane of the coil, which components are the result of fringing effects within the area approximated by the coil perimeter;

(c) means utilizing said coil during said receive intervals for receiving and detecting magnetic field components within said proximate region and having a preselected net resultant magnetic field;

(d) circuit means connected to said coil for forming with said coil, during said transmit intervals, a series resonant tuned circuit and, during said receive intervals, an untuned circuit; and

(e) tri-state output switched-mode operating means connected to said circuit means for providing an intrinsic automatic changeover of said circuit means between said tuned and untuned circuits.

4,963,881

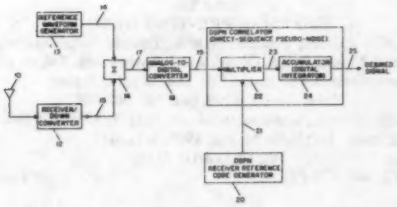
METHOD AND APPARATUS FOR ENHANCING THE SIGNAL RESOLUTION OF AN ANALOG-TO-DIGITAL CONVERTER

Michael R. Franceschini, Centerport, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Oct. 23, 1989, Ser. No. 425,146

Int. Cl.[5] H03M *1/20*

U.S. Cl. 341—131 **8 Claims**



5. Apparatus for enhancing the signal resolution capabilities of an analog-to-digital converter with respect to a supplied first analog signal to be converted, comprising:

means for supplying said first analog signal;

means for forming a composite signal by adding a second analog waveform to said first analog signal, where said second analog waveform has a peak-to-peak amplitude comparable to the maximum peak-to-peak amplitude of said first analog signal, zero average valve, and a larger period than said first analog waveform;

means for converting said composite signal to digital form using an A/D conversion process that inherently has a limited number of quantization levels;

means for integrating said digital composite signal, thereby reducing the undesired effects of said second analog waveform.

4,963,882

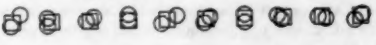
PRINTING OF PIXEL LOCATIONS BY AN INK JET PRINTER USING MULTIPLE NOZZLES FOR EACH PIXEL OR PIXEL ROW

Mark S. Hickman, Escondido, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 27, 1988, Ser. No. 290,543

Int. Cl.[5] B41J *2/01, 2/05*

U.S. Cl. 346—1.1 **16 Claims**



1. A process for depositing two dots of a single colorant onto a printing medium at a single selected pixel location, comprising the steps of:

furnishing two colorant delivery nozzles that each deposit colorant of the same selected color, including a first colorant delivery nozzle and a second colorant delivery nozzle, the two nozzles being located on a traversing mechanism that traverses across the printing medium parallel to its surface;

depositing a first droplet of colorant onto the printing medium at the selected pixel location, from the first colorant delivery nozzle; and

depositing a second droplet of colorant of the same color onto the printing medium at the same selected pixel location, from the second colorant delivery nozzle, the step of depositing a second droplet being accomplished on a different traverse across the printing medium than the step of depositing a first droplet.

4,963,883

INK JET RECORDING HEAD HAVING MAGNETIC DISCHARGE AMOUNT CONTROL MEANS

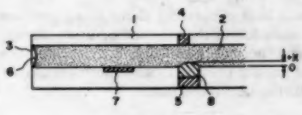
Shinya Matsui, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 128,261, Dec. 1, 1987, abandoned. This application Sep. 28, 1989, Ser. No. 415,381

Claims priority, application Japan, Dec. 3, 1986, 61-286796

Int. Cl.[5] B41J *2/05, 2/175, 2/205*

U.S. Cl. 346—1.1 **15 Claims**



7. An ink jet recording method for discharging a liquid droplet by driving an energy generating member disposed in a liquid path supplied with liquid and communicating with a discharge port for discharging liquid therethrough to be utilized for recording, the method comprising the steps of:

providing discharge amount control means for controlling the size of the liquid droplet discharged through said discharge port by varying the resistance to liquid flow in said liquid path, including a magnetic fluid different from and which does not mix with the liquid and a magnetic force generating member disposed in said liquid path upstream of said energy generating member with respect to said discharge port for generating a magnetic force to shift said magnetic fluid in a direction across that in which the liquid moves in said liquid path when a voltage is applied to said magnetic force generating member and thereby vary the resistance to flow liquid in said liquid path;

applying a voltage to said magnetic force generating member to generate a magnetic force to shift said magnetic fluid; and

then driving said energy generating member to discharge a liquid droplet.

4,963,884

THERMAL PRINTER FOR PREHEATING A RECORDING SHEET

Masao Kiguchi, and Takeshi Ono, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1988, Ser. No. 210,249

Claims priority, application Japan, Jul. 3, 1987, 62-165430

Int. Cl.[5] G01D *9/00, 15/10*; B42J *3/20*

U.S. Cl. 346—1.1 **22 Claims**

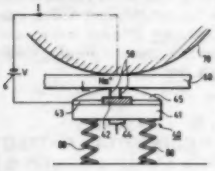
1. A thermal printer for recording an image on a thermosensitive recording sheet, having:

a thermal head for recording an image on the thermoselsitive

recording sheet, said thermal head having a plurality of heat generating elements; and

control means for controlling the heat generation of said thermal head standing by while said thermal head is in contact with the thermosensitive recording sheet during non-recording, so as to generate heat at a low temperature at which image recording is not effected on the thermosensitive recording sheet, so as to dry the thermosensitive recording sheet;

said thermal head generating heat during recording in conformity with image information to effect image recording on the thermosensitive recording sheet.



15. A thermal recording method for recording on a thermosensitive paper, said method comprising the steps of:

recording on the thermosensitive paper by causing a plurality of heat generating elements provided on a thermal head to generate heat in response to image information during recording; and

causing said heat generating elements to generate heat at a temperature lower than the temperature during recording when said thermal head is in a stand-by stat at which said thermal head is pressed to said thermosensitive recording sheet during non-recording.

4,963,885

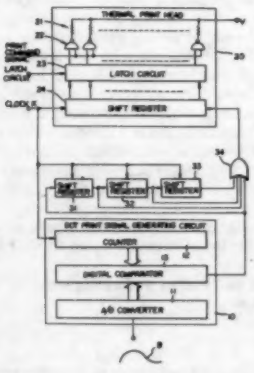
THERMAL HEAD PRINTER

Soichiro Yasunaga, and Isamu Watanabe, both of Kawasaki, Japan, assignors to Oshida Patent Agency, Tokyo, Japan

Filed Feb. 23, 1990, Ser. No. 483,629

Int. Cl.[5] G01D *15/10*; **B41J** *3/20*

U.S. Cl. 346—76 PH **1 Claim**



1. In a thermal head printer circuit comprising:

a thermal print head mounted with a plurality of linearly arrayed dot print elements to which are connected print shift registers undergoing a clock-controlled shift scan and having therein a number of addresses corresponding to the number of dot elements, and

a dot print signal generating circuit for outputting dot print signals when the number of clock pulses from a clock re-set for each scanning cycle equals the level of each of a series of input signals, said print head being adapted to effect for each shift shift scanning cycle simultaneous one-line dot printing of said dot print signals which are loaded and held in predetermined addresses of said print shift registers by shift-scanning, in combination, the improvement comprising:

a plurality of serially connected delay shift registers undergoing a synchronous clock-controlled shift scan to which are inputted said dot print signals outputted from said dot print signal generating circuit, each such register having a number of addresses corresponding to the number of said dot print elements and being effective to output a plurality of consecutive time-delayed counterparts of each said dot print signal; and

an OR gate to which are applied the time-delayed counterparts of said dot print signals outputted from said delay shift registers, and the current real-time dot print signal, wherein the cycle tune of time of the clock-controlled shift scanning operation of said shift registers is set according to the equation $t \leqq T/(n+1)$, where T is the least print cycle sufficient to make said dot print elements normally responsive, and n is the number of said serially connected delay shift registers, the output signals of said OR gate being supplied to said print shift registers of said thermal print head.

4,963,886

THERMAL PRINTING HEAD

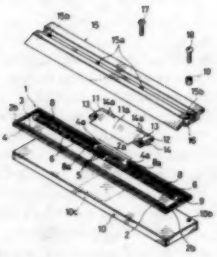
Mitsuhiko Fukuda; Yoshiaki Nagato; Tutomu Nakamura, all of Kyoto; Masato Sakai, Ohtsu, and Takashi Ueda, Tokyo, all of Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Filed Apr. 3, 1990, Ser. No. 503,849

Claims priority, application Japan, May 1, 1989, 1-5186[U]; May 2, 1989, 1-113040; May 2, 1989, 1-113041

Int. Cl.[5] G01D *15/10*

U.S. Cl. 346—76 PH **10 Claims**



1. A thermal printing head comprising:

a heat sink plate;

a head circuit board mounted on said heat sink plate, said circuit board being provided with heating resistor means and a conductor pattern, said circuit board further being provided with drive elements for divisionally activating said resistor means, said conductor pattern including connection terminals;

a connector board having output connection terminals in corresponding relation to said connection terminals of said head circuit board;

a presser cover mounted on said heat sink plate to lie over said connector board; and

pressure applying means for causing said presser cover to press said connector board against said head circuit board so that said output connection terminals come into contact with said connection terminals of said head circuit board; wherein

said connection terminals of said head circuit board are arranged locally within a limited length which is substan-

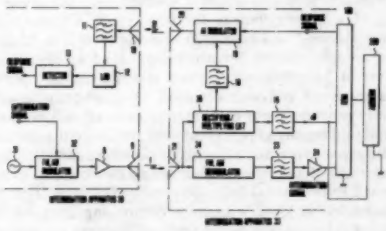
tially smaller than an overall length of said head circuit board, at least selected ones of said connection terminals of said head circuit board being commonly used for at least selected ones of said drive elements by means of wiring conductors formed on said head circuit board; and said pressure applying means is also provided locally for pressing said connector board only in said limited length.

4,963,887

FULL DUPLEX TRANSPONDER SYSTEM

Yoshikazu Kawashima; Ko Ishikawa, both of Kanagawa; Shinichi Haruyama, Gunma, and Fusao Sekiguchi, Tokyo, all of Japan, assignors to Yamatake-Honeywell Co., Ltd. and Yokowo Mfg. Co., Ltd., both of Tokyo, Japan

Filed Aug. 29, 1989, Ser. No. 399,869
Claims priority, application Japan, Aug. 31, 1988, 63-217482
Int. Cl.[5] H01R *39/00*
U.S. Cl. 342—44 **2 Claims**



1. A full duplex transponder system in which interrogation is performed from an interrogation apparatus to a moving unit to be interrogated by using a radio wave, and a transponder apparatus of the moving unit responds to the interrogation, said transponder apparatus comprising:

reception antenna means for receiving an interrogation signal wave whose carrier wave is phase- or frequency-modulated with the interrogation signal,

demodulating means for demodulating the interrogation signal from the interrogation signal wave received by said antenna means,

rectifying means for rectifying the carrier wave of the interrogation signal wave received by said antenna means and outputting a DC power used as a drive power source of said transponder apparatus,

multiplying means for generating a predetermined harmonic component from the carrier wave of the interrogation signal wave received by said antenna means,

modulating means for amplitude-modulating the harmonic component with a response signal, and

transmission antenna means for transmitting a response singal wave output from said modulating means; and said interrogation apparatus comprising:

oscillating means for generating the carrier wave,

modulating means for phase- or frequency-modulating the carrier wave generated by said oscillating means with an interrogation signal,

transmission antenna means for transmitting an interrogation signal wave output from said modulating means,

reception antenna means for receiving the response signal wave output from said transmission antenna means of said transponder apparatus, and

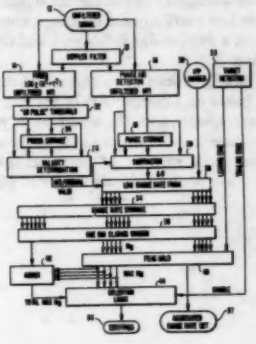
demodulating means for demodulating the response signal from the response signal wave received by said reception antenna means.

4,963,888

SINGLE-SCAN EDITOR OF BIRD ECHOES

John W. Taylor, Jr., Baltimore; Richard A. Eastrom, Ellicott City, and Antonio LoBrutto, Baltimore, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 3, 1988, Ser. No. 267,091
Int. Cl.[5] G01S *13/522, 13/536*
U.S. Cl. 342—90 **25 Claims**



1. A method for identifying characteristics of radar targets indicated by a received signal having a varying interpulse period, comprising the steps of:

(a) calculating possible range rates for a radar target during pulse-to-pulse variation in the interpulse period of the received signal;

(b) comparing the possible range rates, calculated in step (a), corresponding to different pulses in the received signal;

(c) selecting one of the possible range rates in dependence upon said comparing in step (b) to provide an indentifying characteristic of the radar target; and

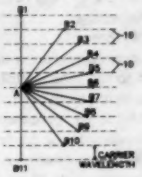
(d) providing a data pass indication as the identifying characteristic when said comparing in step (b) indicates that none of the possible range rates should be selected in step (c).

4,963,889

METHOD AND APPARATUS FOR PRECISION ATTITUDE DETERMINATION AND KINEMATIC POSITIONING

Ronald R. Hatch, Wilmington, Calif., assignor to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Sep. 26, 1989, Ser. No. 413,411
Int. Cl.[5] G01S *5/02*
U.S. Cl. 342—357 **32 Claims**



1. A method for determining the relative position of a secondary receiving antenna with respect to a reference receiving antenna in a satellite-based positioning system, the method comprising the steps of:

making carrier phase measurements based on the reception of a carrier signal from each of a plurality N of satellites,

where N is the minimum number of satellites needed to compute the relative position of the secondary antenna;

deriving from the carrier phase measurements an initial set of potential solutions for the relative position, wherein the initial set of potential solutions all fall within a region of uncertainty defined by a sphere having a radius equal to the maximum distance between the two antennas, and wherein multiple potential solutions arise because of whole-cycle ambiguity of the carrier signal;

making redundant carrier phase measurements based on the reception of a carrier signal from an additional (N+1)th satellite; and

eliminating false solutions from the initial set of potential solutions, based on a comparison of the redundant carrier phase measurements with the initial set of potential solutions, to reduce number of potential solutions to close to one, whereby the number of potential solutions is not reduced by use of the redundant carrier phase measurements.

4,963,890

ANTENNA TRACKING SYSTEM USING SEQUENTIAL LOBING

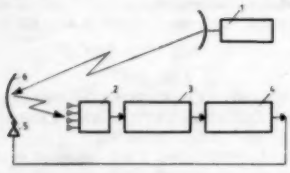
Giorgio Perrotta, and Giacinto Losquadro, both of Rome, Italy, assignors to Selenia Spazio S.p.A., L'Aquila, Italy

Continuation of Ser. No. 860,346, May 27, 1986, abandoned. This application Mar. 14, 1989, Ser. No. 323,078

Claims priority, application Italy, Jul. 27, 1984, 48646 A/84

Int. Cl.[5] G01S *3/44*

U.S. Cl. 342—359 **14 Claims**



1. A system for the fine tracking control of radio frequency (RF) antennae, able to acquire a beacon signal within an angle significantly larger than the −3 dB beamwidth of the antenna beam, said system comprising:

a lobe switching RF sensor;

a phase locked loop receiver/demodulator for modulation tracking coupled to the lobe switching RF sensor; and

a local processor coupled to the output of the phase locked receiver/demodulator for processing error signals from the receiver/demodulator for control of the antennae;

the lobe switching RF sensor comprising at least four illuminators for detecting antenna beam sidelobes, which sidelobes have a decreasing amplitude envelope,

and the phase locked loop receiver/demodulator operating over a loop bandwith in such a way that modulation tracking operates at a frequency at least three times the beam switching frequency, such that the receiver/demodulator produces a video signal output with output voltage characteristics that are exclusively unipolar.

4,963,891

PLANAR ANTENNA

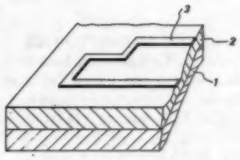
Yoshiki Aoyagi, Yokohama; Atsushi Murakami, Fujisawa; Mamoru Nakada, Machida; Mitsunori Ajiki, and Shigeru Suzuki, both of Fujieda, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Sep. 29, 1987, Ser. No. 332,890

Claims priority, application Japan, Sep. 30, 1986, 61-233010

Int. Cl.[5] H01Q *1/38, 13/08*

U.S. Cl. 343—700 MS **15 Claims**



1. A planar antenna comprising a porous dielectric layer comprising at least one polymer selected from the group consisting of a 3-methylbutene-1homopolymer, a copolymer of 3-methylbutene-1 and an α-olefin having from 2 to 12 carbon atoms, a copolymer of 3-methylbutene-1and a polyene, a copolymer of 3-methylbutene-1, said α-olefin and said polyene, and a modified polymer obtained by graft-polymerizing a radically polymerizable monomer to each of said homopolymer and said copolymers; a conductor on one of the surfaces of said dielectric layer; and a circularly polarized radiation microstrip element on the other surface of said dielectric layer which is formed from a metal foil; said porous dielectric layer being produced by molding a mixture comprising 20 to 70% by weight of at least one polymer selected from the group consisting of said homopolymer, said copolymers and said modified polymer and 30 to 80% by weight of at least one plasticizer selected from the group consisting of an aliphatic compound, an aromatic compound, an aliphatic mineral oil and an aromatic mineral oil at a temperature of from 260° to 320° C. into a sheet form, and then subjecting the sheet to extraction with a low-boiling solvent.

4,963,892

MICROWAVE PLANE ANTENNA WITH TWO ARRAYS WHICH HAVE BEAMS ALIGNED IN THE SAME DIRECTION

Masayuki Matsuo, Kobe; Toshio Abiko; Yoshiaki Ueno, both of Ibaraki, and Minoru Kanda, Shijonawate, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Continuation of Ser. No. 754,989, Jul. 15, 1985, abandoned. This application Apr. 12, 1989, Ser. No. 336,537

Claims priority, application Japan, Jul. 13, 1984, 59-145291; Jul. 13, 1984, 59-145293

Int. Cl.[5] H01Q *13/08*

U.S. Cl. 343—700 MS **2 Claims**

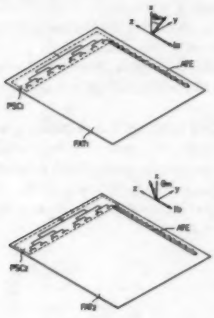
1. A microwave plane antenna comprising:

a first plane antenna part for receiving circularly polarized waves and including a first plurality of antenna elements arranged in parallel rows extending in a first direction, each antenna element of said first plurality of antenna elements including a pair of microstrip conductor lines configured as a pair of out-of-phase square waves for receiving a first main beam,

a second plane antenna part for receiving said circularly polarized waves and including a second plurality of antenna elements arranged in parallel rows extending in a second direction opposite said first direction, each antenna element of said second plurality of antenna elements including a pair of microstrip conductor lines configured as a pair of out-of-phase square waves for receiving a second main beam,

each of said first and second plane antenna parts further including a corporate feed network connected to signal-receiving ends of the respective plurality of antenna elements,

said rows of antenna elements of said first antenna part being parallel to corresponding said rows of antenna elements of said second antenna part and spaced therefrom to form a space therebetween in which said corporate feed networks of said first and second antenna parts are disposed, said corporate feed networks being arranged in axial symmetry relative to an imaginary line extending centrally through said space perpendicular to said first and second directions,



said first main beam having an inclination in the same direction as said first direction in which said antenna elements of said first antenna extend and a traveling wave current flows through the elements from said corporate feed network, said second main beam having an inclination in a direction opposite to said second direction in which said antenna elements of said second antenna part extend and a traveling wave current flows through the elements from said corporate feed network, said main beams of the first and second plane antenna parts being parallel in inclination relative to each other and defining a composite main beam.

4,963,893

HEAT-RESISTANT INSULATING SUBSTRATE, THERMAL PRINTING HEAD, AND THERMOGRAPHIC APPARATUS

Katsuhisa Homma, Kawasaki; Masaru Nikaido, Miura; Yoshiaki Ouchi; Mutsuki Yamazaki, both of Yokohama, and Shuji Yoshizawa, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

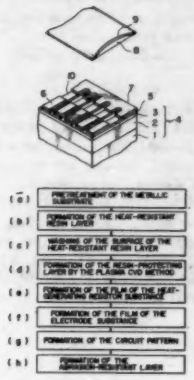
Filed Mar. 27, 1989, Ser. No. 328,980

Claims priority, application Japan, Mar. 28, 1988, 63-74241; Sep. 13, 1988, 63-227524

Int. Cl.[5] G01D *9/00*

U.S. Cl. 346—76 PH **3 Claims**

1. A heat-resistant insulating substrate, comprising at least a highly thermoconductive supporting substrate, a heat-resistant resin layer formed on the supporting substrate, and a resin-protecting layer deposited on the heat-resistant resin layer and formed of one layer, or a plurality of layers, of an amorphous substance containing at least one member from selected hydrogen and halogen elements and using as main components



thereof silicon and at least one member selected from nitrogen, carbon, and oxygen.

4,963,894

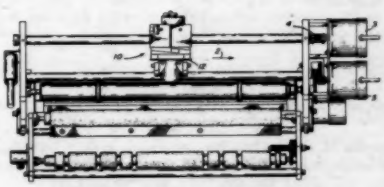
SYSTEM FOR ELECTRONICALLY CONTROLLING LED-ARRAY IMAGE PRINTER

Donald R. Lebeau, Greenville, and Paul J. Kalutkiewicz, Windham, both of N.H., assignors to Itek Graphix Corp., Niles, Ill.

Continuation-in-part of Ser. No. 112,791, Oct. 23, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 252,628

Int. Cl.[5] G01D *15/16;* **H04N** *1/21*

U.S. Cl. 346—107 R **5 Claims**



1. A method of controlling an image printer including an LED array printhead that is scanned perpendicular to the direction of travel of the photosensitive medium being exposed, comprising the steps of:

providing raster image data to an image printer control unit;

storing at least a portion of said raster image data in memory within said image printer control unit;

designating as exposure bands each set of exposure data within said stored raster image data corresponding to one complete scanning exposure of the LED array;

identifying from said exposure data for each exposure band any scan line for which no information is to be printed;

terminating the exposure scan of the LED array on a scan termination line where no information is to be printed; and

commencing the next exposure scan on a line subsequent to said exposure scan termination line.

4,963,895

ILLUMINATION/RECORDING SYSTEM WITH MOVABLE FLUORESCENT SUBSTANCES

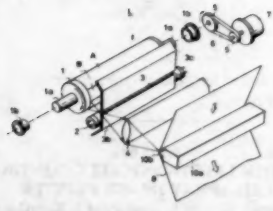
Toshiaki Harada; Tadashi Yamamoto, both of Kawasaki, and Masanori Takenouchi, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 41,043, Apr. 21, 1987, abandoned. This application Jan. 19, 1989, Ser. No. 300,692

Claims priority, application Japan, Apr. 24, 1986, 61-93368; Sep. 11, 1986, 61-212802; Sep. 11, 1986, 61-212803; Sep. 24, 1986, 61-223726; Nov. 27, 1986, 61-280738

Int. Cl.[5] G01D *15/14*; H01J *40/14*; H04N *1/46*

U.S. Cl. 346—108 **28 Claims**



1. An illumination apparatus adapted for illuminating an object with light, comprising:

(a) a light-emitting member for emitting light;

(b) a plurality of fluorescent substances each having a different spectral property and being disposed is different planes, said fluorescent substances emitting light by receiving light emitted from said light-emitting member; and

(c) drive means for respectedly positioning said plurality of fluorescent substances at a predetermined position, where said fluorescent substances receive the light emitted from said light-emitting member.

4,963,896

RECORDING MEDIA TRANSPORTING DEVICE WITH ARCSHAPED PATH

Sadanobu Murasaki, and Hajime Takei, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 26, 1989, Ser. No. 343,355

Claims priority, application Japan, Apr. 28, 1988, 63-105697; Apr. 28, 1988, 63-105698

Int. Cl.[5] G01D *15/28*; B65H *9/10, 5/16, 5/36, 5/38*

U.S. Cl. 346—134 **12 Claims**

6. A device for transporting recording media from a storing portion to an image forming portion comprising:

storing means provided at the storing portion for storing the recording media;

feeding means for feeding the recording media from the storing means;

arcshaped upper and lower members disposed opposite one another to have a predetermined space therebetween, said space forming an arcshaped path for transporting the recording media, wherein said upper and lower members are positioned between the storing portion and the image forming portion;

transporting means for transporting the recording media through the arcshaping path; and

a width regulating member for regulating a position of the recording media, wherein the regulating member approaches the recording media from a direction perpendicular to the transporting direction of the recording media when the recording media is in the arcshaped path.

7. A device for transporting recording media from a storing portion to an image forming portion comprising:

storing means provided at the storing portion for storing the recording media;

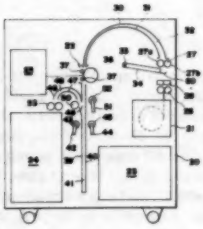
feeding means for feeding the recording media from the storing means;

arcshaped upper and lower members disposed opposite one another to have a predetermined space therebetween, said space forming an arcshaped path for transporting the recording media, wherein said arcshaped upper and lower members are positioned between the storing portion and the image forming portion;

a lever pivotally mounted to a rotating shaft, said lever having a hook at a free end thereof;

driving means for pivotally moving the lever about the rotating shaft to push a trailing end of the recording media by the hook; and

a width regulating member for regulating a position of the recording media, wherein the regulating member approaches the recording media from a direction perpendicular to the transporting direction of the recording media when the recording media is in the arcshaped path.



10. A device for transporting recording media from a storing portion to an image forming portion comprising:

storing means provided at the storing portion for storing the recording media in a roll form;

take-up means for taking-up the leading end of the recording media from the storing means;

cutting means for cutting the recording media taken up by the take-up means to obtain a sheet medium having a specified length;

arcshaped upper and lower members disposed opposite to one another to have a predetermined space therebetween, said space forming an arcshaped path for transporting the sheet media, wherein said arcshaped upper and lower members are positioned between the storing portion and the image forming portion and are arranged to curve in the same direction as a curling direction of taken-up recording media;

a lever pivotally mounted to a rotating shaft, said lever having a hook at a free end thereof; and

driving means for pivotally moving the lever about the rotating shaft to push a trailing end of the sheet medium by the hook.

4,963,897

PLANAR INK-JET PRINT HEAD IN A DUAL IN-LINE PACKAGE

Erich Kattner, Neubiberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

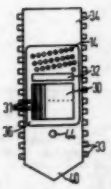
PCT No. PCT/DE88/00153, § 371 Date Oct. 10, 1989, § 102(e) Date Oct. 10, 1989, PCT Pub. No. WO88/07935, PCT Pub. Date Oct. 20, 1988

PCT Filed Mar. 15, 1988, Ser. No. 430,443

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1987, 3712891

Int. Cl.[5] B41H *2/045*

U.S. Cl. 346—140 R **7 Claims**



1. An ink-jet print head for an ink-jet printing device, comprising a sandwich ink-jet head having individual superjacently arranged plates (14, 16, 19, 23, 26) which accommodate ink ducts, drive elements, pressure chambers and the like and which are rigidly connected to one another;

an ink inlet opening (44) for supplying the printing fluid (41);

a plug-in package accommodating said sandwich ink-jet head and having connecting leads (33), said plug-in package having on its top side a receiving opening (35) for said sandwich ink-jet head and a further contacting and balancing opening (36) arranged on the top side or underside of said plug-in package being formed to be tightly sealed with respect to ink;

electric balancing elements (31) assigned to each of said drive elements of said sandwich ink-jet head, all balancing elements (21) being arranged on a balancing plate (30) which is arranged in the plug-in package and which is designed to be balanced via said contacting and balancing opening (36), and said balancing elements being in the form of resistors (31) suitable being balanced using a laser.

4,963,898

METHOD AND APPARATUS FOR FORMING A COLOR IMAGE

Toshihiro Kadowaki, and Masanori Sakai, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 299,064, Jan. 19, 1989, abandoned. This application Nov. 15, 1989, Ser. No. 436,800

Claims priority, application Japan, Jan. 19, 1988, 63-10135; Jan. 19, 1988, 63-10136; Jan. 19, 1988, 63-10140; Jan. 19, 1988, 63-10142

Int. Cl.[5] G01D *15/00*

U.S. Cl. 346—157 **34 Claims**

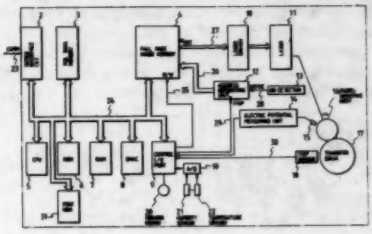
1. A color image forming apparatus comprising:

(a) input means for inputting coded character or figure information;

(b) image forming means for forming a color image by using a plurality of output color components;

(c) converting means for converting said coded information input by said input means into an image pattern and for writing the image pattern into image memories of a number which is smaller than the number of said plurality of output color components; and

(d) control means for allowing the operation of said converting means to be repeated so as to convert said plurality of



output color components into image patterns and write the image patterns into said image memories.

4,963,899

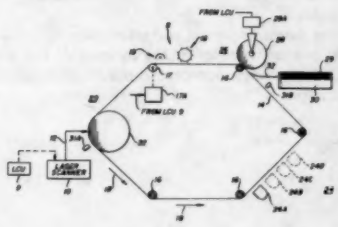
METHOD AND APPARATUS FOR IMAGE FRAME REGISTRATION

William A. Resch, III, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 11, 1989, Ser. No. 419,983

Int. Cl.[5] G01D *15/10*

U.S. Cl. 346—157 **14 Claims**



1. An apparatus for reproducing an image, comprising:

a photosensitive member;

a single recording station for recording multiple latent images, in respective image frames, and respective image frame registration indicia on the photosensitive member;

sensing means for detecting the indicia and generating corresponding signals; and

means responsive to the signals for controlling the recording of selected ones of the multiple latent images in predetermined spaced relationship with at least one prior recorded latent image on the photosensitive member.

4,963,900

MULTIPLE LASER BEAM SCANNING OPTICS

Russell A. Budd, Longmont; Joan S. Goddard, Boulder, and Mikel J. Stanich, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 388,544, Aug. 1, 1989, abandoned. This application Dec. 1, 1989, Ser. No. 445,085

Int. Cl.[5] G01D *9/42*; G02B *27/17*

U.S. Cl. 346—160 **24 Claims**

19. An electrophotographic printing machine comprising;

photoreceptive material mounted for cyclical movement;

a charge generating means located adjacent said photoreceptive material for placing a charge across said material;

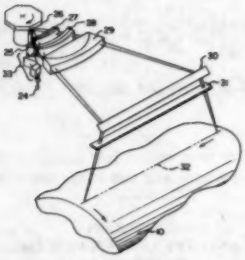
an imaging station at which said charged photoreceptive material receives light beams to selectively discharge

portions of said material in accordance with an image to be printed wherein said imaging station is illuminated by a printhead which includes a source of multiple laser beams;

a cylindrical lens;

a rotating polygonal mirror containing facets upon which all laser beams are directed by said cylindrical lens;

an anamorphic lens means and a scanning lens means for receiving said multiple laser beams from said rotating mirror and directing said beams to an image plane,



wherein said scanning lens means is comprised of at least one lens group employing multiple elements all of which have approximately the same index of refraction but different dispersion factors at a nominal wavelength.

toner material;

developer means to deposit said toner material on said image to be printed; transfer means to transfer the developed image from said photoreceptive material to print receiving material.

4,963,901

DIRECT READ AFTER WRITE OPTICAL STORAGE MEDIUM AND INFORMATION STORAGE SYSTEM

Richard L. Wilkinson, El Toro, and John S. Winslow, Alta Dena, both of Calif., assignors to Optical Disc Corporation, Cerritos, Calif.

Division of Ser. No. 508,498, Jun. 27, 1983, Pat. No. 4,809,022. This application Feb. 27, 1989, Ser. No. 316,177

Int. Cl.[5] G01D *15/10, 15/34*

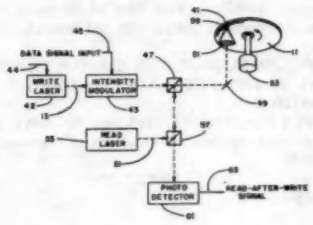
U.S. Cl. 346—76 L **10 Claims**

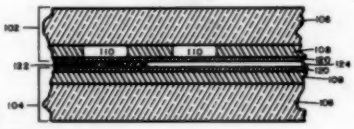
1. An optical information storage medium for direct reading after writing, comprising:

a transparent substrate;

a layer of predetermined thickness of light-responsive material on a first surface of said substrate, said material being a dielectric and having a threshold energy level above which it responds to light by spontaneously decomposing to form primarily gaseous components thereby forming a void within said layer, and below which threshold energy level it does not respond; and

a reflective layer of highly electrically conductive material on the opposite side of said light-responsive layer from said substrate, said reflective layer being sufficiently rigid that it is not significantly distorted by a decomposition of an area of said light-responsive layer,





said medium being at least 75% reflective of light having a wavelength of 6328 Å.

4,963,902

CAMERA SYSTEM

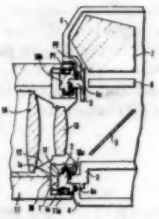
Hidehiko Fukahori, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1989, Ser. No. 297,350

Claims priority, application Japan, Jan. 19, 1988, 63-004829[U]; Jun. 23, 1988, 63-083056[U]

Int. Cl.[5] G03B *17/08*

U.S. Cl. 354—64 **11 Claims**



1. A camera system comprising:

(a) a camera body including:

(a-1) a camera-side mount;

(a-2) a groove which is disposed in rear of a mount abutting face of said camera-side mount in the direction of an optical axis and which is formed on an outer circumference of said camera-side mount; and

(a-3) a ring-shaped elastic member disposed in said groove; and

(b) an optical accessory including:

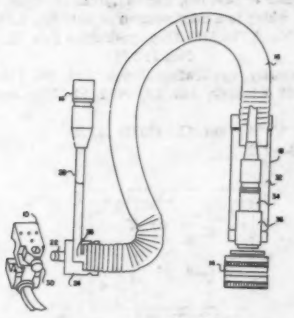
(b-1) an accessory-side mount which is capable of being coupled with said camera-side mount; and

(b-2) a tubular protruding part which is disposed in rear of a mount abutting face of said accessory-side mount in the direction of the optical axis, said tubular protruding part having an inner circumferential face which is capable of being brought into pressure contact with said ring-shaped elastic member.

4,963,903
CAMERA POSITIONING SYSTEM

Richard M. Cane, 6142 Miramar Pkwy., Miramar, Fla. 33023

Filed Oct. 25, 1989, Ser. No. 426,290
Int. Cl.[5] G03B 29/00
U.S. Cl. 354—81 22 Claims



1. A system for positioning a camera relative to a work area, the system comprising:

(a) clamp means situated outside of said work area;

(b) depending from said clamp means, a flexible extension and support element comprising a multiplicity of co-active mated segments, said segments in combination defining, at any interface thereof a potential radius, said extension and support element having a length sufficient to reach said work area from said clamp means;

(c) electrical means disposed axially within said extension and support element;

(d) socket means integrally depending from said support element at that end of said support element opposite said clamp means;

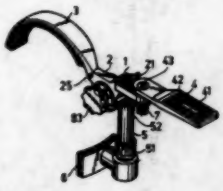
(e) a camera mechanically held within said socket means and in electrical communication with said electrical means; and

(f) means for remote control of said camera, said control means in electrical communication means with said electrical means.

4,963,904
PORTABLE CAMERA SUPPORT ASSEMBLY

Chun Mao Lee, No. 22, Alley 7, Lane 428, Chung Cheng N. Rd., San Chung City, Taipei Hsien, Taiwan

Filed Sep. 19, 1989, Ser. No. 409,327
Int. Cl.[5] G03B 29/00
U.S. Cl. 354—82 2 Claims



1. A portable camera support assembly which is supported and balanced by a user's body and releasably coupled to an underside portion of a camera, comprising the combination of:

an adjustment block (1) having an engagement block (11) formed on one end thereof, said engagement block (11) including a circular wall from which extends an integrally formed cylindrical protrusion (15), said cylindrical protrusion (15) having a centrally located threaded opening (12) formed therein;

a support member (2) pivotally coupled to said adjustment block (1) by a torsional spring assembly (8), said support member (2) including (a) an annular support portion (26) adapted to receive in a first direction said cylindrical protrusion (15) therein, (b) a rigid padded shoulder rest portion (3) extending from said annular support portion (26) in a second direction, said second direction being transverse said first direction, and (c) a camera platform portion (21) extending from said annular support portion (26) in a direction opposite said second direction, said torsion spring assembly (8) including (a) a torsional spring (84) disposed within said annular support portion (26) of said support member (2) and having one end (80) coupled to said cylindrical protrusion (15) and an opposing end (80) coupled to said annular support portion (26), said one end (80) being received within one of a plurality of slotted openings (13) formed in said cylindrical protrusion (15), and (b) an adjustment knob (83) coupled to said cylindrical protrusion (15) by a double ended bolt (82) passing through a plate member (81) for threaded coupling with said threaded opening (12) of said cylindrical protrusion (15);

a camera mount (4) coupled to said camera platform portion (21) of said support member (2) by a fastening member (7), said camera mount (4) having a slotted through opening formed therein for receiving a slide bolt (42) therethrough to provide an adjustable coupling with said underside of said camera;

a lengthwise-extendable hand grip (5) threadedly coupled to a bottom portion of said adjustment block (1) for releasable coupling therewith, said lengthwise-extendable hand grip (5) being defined by a lower cylindrical column (53) telescopically received within an upper cylindrical column (52), said lengthwise-extendable hand grip (5) including a clamping ring (51) for releasably securing said lower cylindrical column (53) to said upper cylindrical column (52);

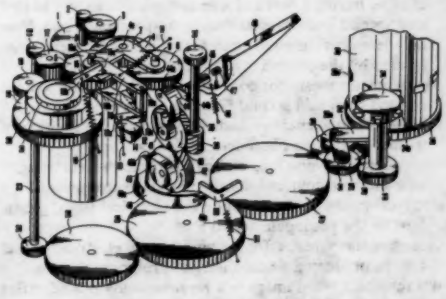
a body rest member (6) having an arcuate portion on one end thereof and being fixedly coupled to a lower portion of said lower cylindrical column (53) on an opposing end; and,

a pair of strap fixing lugs (25) coupled to opposing sides of said support member (2) for securing opposing ends of a shoulder strap (9) thereto.

4,963,905
CAMERA

Shosuke Haraguchi, and Masanori Ishikawa, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1988, Ser. No. 278,345
Claims priority, application Japan, Dec. 4, 1987, 62-307035; Dec. 8, 1987, 62-310130
Int. Cl.[5] G03B 1/12, 19/12
U.S. Cl. 354—152 16 Claims



1. A camera of the pre-winding type, in which a loaded film

is wound prior to a photographing operation which is performed with the film being rewound, comprising:

(a) a built-in motor;

(b) a film winding mechanism arranged to be driven by said motor serving as a drive source;

(c) a mirror mechanism arranged to be driven by said motor serving as a drive source;

(d) a film rewinding mechanism arranged to be driven by said motor serving as a drive source; and

(e) switching means for transmitting an output of said motor to said film winding mechanism or said mirror mechanism in response to rotation of said motor in a first direction and for transmitting an output of said motor to said film rewinding mechanism in response to rotation of said motor in a second direction, said switching means being arranged to change over the transmission of an output of said motor when rotating in said first direction from transmission to said film winding mechanism to transmission to said mirror mechanism in response to the rotation of said motor in said second direction.

4,963,906

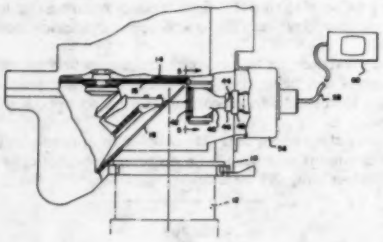
FIBER-OPTICALLY COUPLED VIDEO VIEWFINDER

Ronald C. Goodman, 12320 Montana Ave., #303, Los Angeles, Calif. 90049

Filed Jan. 17, 1989, Ser. No. 298,070

Int. Cl.[5] G03B *13/02*

U.S. Cl. 354—219 **39 Claims**



1. An improved video viewfinding system for a reflex camera which permits viewing a formed image independently of an eye piece comprising:

a fiber optic element having a plurality of fused coherent optical filaments arranged in a bundle, said fiber optic element having a first and a second transverse face at first and second ends of said bundle respectively, said fiber optic element disposed such that a focused reflex image formed by the camera is formed on said first face,

photodetector means for converting and in response to light emitted from said second face into an electrical signal,

the fiber optic element extending only from the position of its first end to the photodetector means,

the second transverse face of the fiber optic element being in near intimate contact with the photodetector means,

electrical means for transmitting the electrical signal generated by the photodetector to a

video monitor means for receiving said electrical signal and/or producing a video image in response thereto,

whereby said video image is a representation of said reflex image formed by the camera.

4,963,907

PHOTOGRAPHIC CAMERA

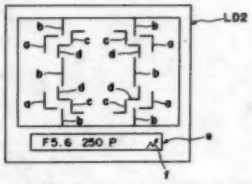
Manabu Inoue, Kobe; Nobuyuki Taniguchi; Yoshiaki Hata, both of Nishinomiya; Takeo Hoda, Kawachinagano; Yoshinobu Kudo, Sakai, and Hiroshi Ueda, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 205,681, Jun. 13, 1988, Pat. No. 4,829,333, which is a continuation of Ser. No. 1,633, Jan. 8, 1987, Pat. No. 4,774,536. This application Feb. 21, 1989, Ser. No. 312,751

Claims priority, application Japan, Jan. 10, 1986, 61-4081; Jan. 10, 1986, 61-4082; Jan. 13, 1986, 61-5501; Jan. 13, 1986, 61-5503

Int. Cl.[5] G03B *13/10*

U.S. Cl. 354—222 **4 Claims**



1. A photographic camera comprising:

means for outputting a signal in response to a manual operation;

means for selecting, in response to the signal, a photographing mode from a first photographing mode and a second photographing mode in which a range having a different aspect ratio from that in the first photographing mode will be printed;

first means for displaying, in a viewfinder of the camera, the range which will be printed; and

second means for displaying information relating to the aspect ratio of the selected photographing mode.

4,963,908

SHUTTER FOR CAMARA

Yasuhiro Toyoda, and Tsuyoshi Fukuda, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,514

Claims priority, application Japan, Sep. 25, 1987, 62-147356[U]; Sep. 28, 1987, 62-148745[U]

Int. Cl.[5] G03B *9/36*

U.S. Cl. 354—246 **10 Claims**

1. A shutter for a camera having leading and trailing blade groups movably interposed between a plurality of plate-shaped members each of which having a shutter aperture, each of said blade groups including a plurality of divided blades, comprising:

(a) a protruding part formed along an edge part of said

shutter aperture on one side thereof located in the moving direction of said blade groups, said protruding part being arranged:

(a-1) to protrude from said edge part of said shutter aperture at an angle directed away from a plane defined by said blade groups; and

(a-2) to have a slanting face.

4,963,909

CAMERA SYSTEM FOR SELECTIVELY GENERATING NEW MEMORY ADDRESS WHEN A NEW SWITCHING STATE IS DIFFERENT FROM A PREVIOUS SWITCHING STATE

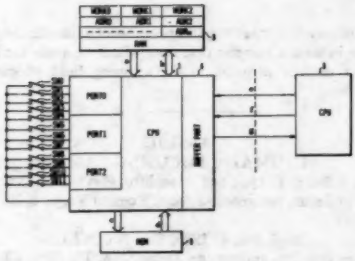
Hajime Fukui, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1988, Ser. No. 284,907

Claims priority, application Japan, Dec. 24, 1987, 62-325474

Int. Cl.[5] G03B *17/00*; G06F *12/02*

U.S. Cl. 354—286 5 Claims



1. A camera system comprising a camera and an attachment device attachable to said camera wherein:

(A) said camera has a communication terminal portion, and

(B) said attachment device has a communication terminal portion connectable to said communication terminal portion of said camera, said attachment device further comprising:

a computer provided with data memorizing means having a plurality of memory portions, each for memorizing respective data, and each being addressable by designation of an address,

a plurality of information switch means, said computer having an input portion connected to said plurality of information switch means, switch state detecting means for detecting states of said information switch means,

switch state memorizing means for memorizing said states detected by said switch state detecting means, address operation means for designating addresses corresponding to the switch states,

address memorizing means for memorizing said addresses obtained by said address operation means, and renewal means for causing said address operation means to operate selectively when a switch state previously memorized in said switch state memorizing means is not coincident with a new switch state detected by said detecting means to renew the address previously memorized in said address memorizing mans to a newly designated address and to renew the switch state memorized in said switch state memorizing means to the new switch state detected by said detecting means,

said memory portions respectively being designated by the address memorized in said address memorizing means to transfer data of the memory portion thus designated to said camera through the communication terminal portion of said attachment device.

4,963,910

CAMERA SYSTEM AND INTERMEDIATE ACCESSORY

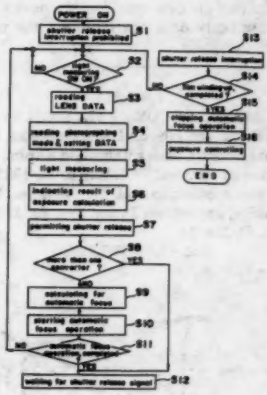
Toshihiko Ishimura, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 291,321, Dec. 28, 1988, abandoned, which is a continuation of Ser. No. 155,504, Feb. 12, 1988, abandoned. This application Feb. 6, 1990, Ser. No. 475,900

Claims priority, application Japan, Feb. 16, 1987, 62-34739

Int. Cl.[5] G03B *13/36*

U.S. Cl. 354—400 7 Claims



1. A camera system which includes

a camera body having a first type of connecting means,

an interchangeable lens having a second type of connecting means which is connectable to the first type of connecting means, and

one or more intermediate accessories having a connecting means of the first type and a connecting means of the second type,

whereby said first type of connecting means of the intermediate accessories are connectable with one of the second type of connecting means of the interchangeable lens and the second type of connecting means of another intermediate accessory and

said second type of connecting means of the intermediate accessories are connectable with one of the first type of connecting means of the camera body and the first type of connecting means of another intermediate accessory, said camera system further comprising:

first data producing means, provided in the interchangeable lens, for producing a first data indicative of the interchangeable lens;

first data sending means, provided in the interchangeable lens, for sending the first data to a device which is connected to the interchangeable lens by means of the second type of connecting means thereof;

second data producing means, provided in said one or more intermediate accessories, for producing a second data indicative of the presence of an intermediate accessory;

adding means, provided in said one or more intermediate accessories, for adding the second data to a data supplied from a device which is connected to the intermediate accessory by means of the first type of connecting means thereof and for producing a third data based on the result of the addition;

second data sending means, provided in said one or more intermediate accessories, for sending the third data to a device which is connected to an intermediate accessory by means of the second type of connecting means thereof;

discriminating means, provided in the camera body, for discriminating whether or not the data sent from a device

connected to the camera body by means of the first type connecting means thereof represents a predetermined value which indicates that the number of intermediate accessories inserted between the camera body and the interchangeable lens is less than two;

focus control means, provided in the camera body, for automatically controlling the focusing condition of the interchangeable lens interconnected to the camera body directly or through an intermediate accessory; and

interrupting means for interrupting the operation of the focus control means when the discriminating means discriminates that the data sent from the device connected to the camera body does not represent the predetermined value.

4,963,911

AUTOMATIC FOCUS DETECTION SYSTEM

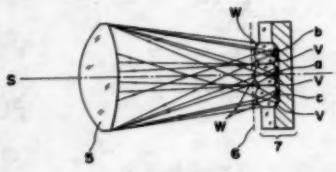
Toru Matsui, Sakai, and Hiroshi Ueda, Habikino, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 99,725, Sep. 22, 1987, Pat. No. 4,843,415. This application Jun. 19, 1989, Ser. No. 368,181

Claims priority, application Japan, Sep. 22, 1986, 61-224113; Sep. 22, 1986, 61-224114

Int. Cl.[5] G03B *13/36*

U.S. Cl. 354—403 **11 Claims**



1. An illumination device, which is employed with a focus detection device for detecting a focus condition relating to a plurality of focus detection areas, and which is located behind at least a projection lens projecting light toward an object field so as to illuminate regions corresponding to the focus detection areas, comprising:

first means, having a plurality of light sources, for emitting light;

second means, having a plurality of lenses located in front of each of the light sources, for making the light, which is emitted from the respective light source, to pass through a predetermined position of an entrance pupil of the projection lens; and

third means for combining the first means with the second means so as to form a packaged illumination device.

4,963,912

CAMERA APPARATUS HAVING MEANS FOR SETTING THE POSITION OF AN OPTICAL GRATING AT A DESIRED LOCATION IN THE VIEWFINDER

Yasuo Suda, and Masaki Higashihara, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1988, Ser. No. 281,780

Claims priority, application Japan, Dec. 14, 1987, 62-315535; Dec. 14, 1987, 62-315536; Dec. 14, 1987, 62-315537; Dec. 14, 1987, 62-315538

Int. Cl.[5] G03B *13/00*

U.S. Cl. 354—404 **16 Claims**

1. A camera apparatus comprising:

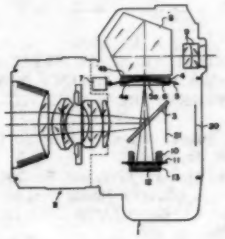
a view finder having a focusing screen;

photosensing means for forming an electrical signal representing a focus adjusting state of an objective lens;

a beam splitter for distributing the light transmitted by said objective lens to said view finder and said photosensing means;

a translucent scanning member positioned between said beam splitter and said focusing screen, in the vicinity of said focusing screen, and having reflective areas formed as slits for directing the light to said photosensing means through said beam splitter;

scanning means for scanning said scanning member in the direction of array of said reflective areas; and



setting means for setting the position of said scanning member in such a manner that said reflective areas are located in a desired position in the viewing field of said view finder.

4,963,913

AUTOMATIC FOCUSING CAMERA

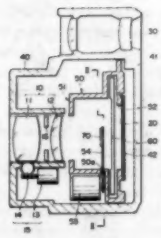
Osamu Shindo, Tokyo, and Masahiro Hayakawa, Yokohama, both of Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Jun. 6, 1989, Ser. No. 362,106

Claims priority, application Japan, Jun. 17, 1988, 63-149475

Int. Cl.[5] G03B *3/00*

U.S. Cl. 354—406 **3 Claims**



1. An automatic focusing camera comprising a photographing system including a taking lens system having a focusing lens moveable along an optical axis of light entering the camera and a film to be exposed by the light, said automatic focusing camera further comprising:

focus point detecting means for detecting a focus point by means of the light entering said taking lens system, said focus point detection means comprises a plurality of units, each including a first light receiving element for receiving light transmitted through one side of the central optical axis of the taking lens system, a second light receiving element for receiving light transmitted through the other side of said axis, and a re-imaging lens corresponding to a pair of said first and second light receiving elements;

first control means for controlling said focus point detection means such that said focus point detection means is located at a position between the taking lens system and film during a desired period for detecting the focus point, and is retracted from the position when the focus point has been detected; and

second control means for controlling said focusing lens so as

to be located at a position corresponding to the focus point detected by said focus point detection means.

4,963,914

FLASH PHOTOGRAPHING SYSTEM

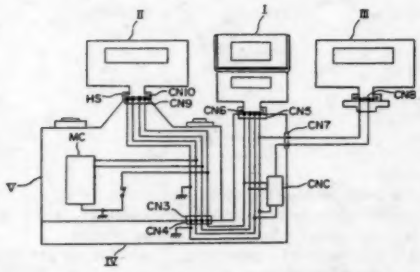
Nobuyuki Taniguchi, Tondabayashi; Hiroshi Hosomizu, Nara; Kenji Tsuji, Kashiwara; Takanobu Omaki, Kennan, and Masaaki Maksi, Nara, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 129,324, Dec. 1, 1987, which is a continuation of Ser. No. 819,015, Jan. 15, 1986, abandoned, which is a division of Ser. No. 614,031, Apr. 25, 1984, Pat. No. 4,573,786. This application Sep. 21, 1989, Ser. No. 410,732

Claims priority, application Japan, May 27, 1983, 58-94605; Jun. 1, 1983, 58-98227; Jun. 4, 1983, 58-100050; Jun. 7, 1983, 58-102407; Jun. 10, 1983, 58-104650; Jun. 13, 1983, 58-106424; Jun. 15, 1983, 58-108484; Jun. 17, 1983, 58-109921; Jun. 18, 1983, 58-109854; Jun. 21, 1983, 58-112326; Jun. 23, 1983, 58-113920; Jun. 23, 1983, 58-113921; Mar. 13, 1984, 59-48435

Int. Cl.[5] G03B *15/05*

U.S. Cl. 354—413 2 Claims



1. In a flash photography system, an electronic flash device connectable to a device operative with the electronic flash device in the system, comprising:

means for emitting flash light;

means for storing electric power for operation of said emitting means;

means for initiating flash light emission from said emitting means;

a first terminal connectable with the operative device for receiving a flash initiating signal from the operative device for operation of said initiating means;

a second terminal connectable with the operative device;

means for receiving data from the operative device through said second terminal in advance of initiation of exposure control operation, the data having a plurality of bits and representing an exposure control mode to be executed;

means for determining an operation mode of the electronic flash device based on the received data representing the exposure control mode;

means for displaying the determined operation mode; and

means for controlling the operation of the electronic flash device based on the determined operation mode.

4,963,915

BRIGHTNESS MEASURING APPARATUS FOR PROVIDING ADEQUATE OBJECT BRIGHTNESS AND A FLASHLIGHT EMISSION APPARATUS PROVIDING ADEQUATE EXPOSURE, IRRESPECTIVE OF PHOTOGRAPHING CONDITIONS

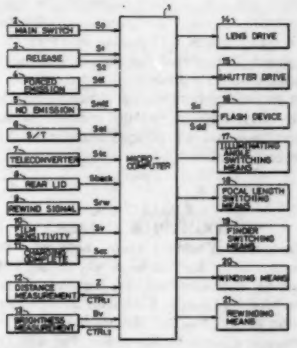
Masayuki Ikemura; Takehiko Karasaki, and Manabu Inoue, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 16, 1989, Ser. No. 352,502

Claims priority, application Japan, May 16, 1988, 63-118620; May 16, 1988, 63-118621

Int. Cl.[5] G03B *7/08*

U.S. Cl. 354—432 17 Claims



1. A brightness measuring apparatus comprising:

light receiving means having a plurality of light receiving elements for respectively receiving light from a plurality of areas in a photographic range and outputting data values corresponding to said areas based on the respective amounts of light received;

focal length detecting means for detecting the focal length of a photographing lens;

deciding means for deciding a rear light detection level value based on the focal length detected; and

rear light judging means for judging whether or not rear light photography is to be carried out based on the values outputted from said light receiving means and the rear light detection level value.

4,963,916

PHOTOGRAPHIC CAMERA

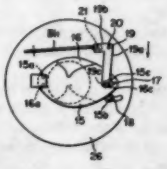
Yoshihiro Tanaka; Sadafusa Tsuji, both of Osaka; Yoshiaki Hata, Nishinomiya; Manabu Inoue, Kobe; Hiroshi Ootsuka, Sakai; Michihiro Iwata, Sakai; Fumiaki Ishito, Sakai, and Koh Hayama, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 13,561, Feb. 11, 1987. This application Jun. 8, 1988, Ser. No. 203,892

Claims priority, application Japan, Feb. 12, 1986, 61-29399

Int. Cl.[5] G03B *7/08*

U.S. Cl. 354—435 2 Claims



1. A camera, comprising:

a power source;
boosting means for boosting a voltage of said power source;
charging means for accumulating therein energy boosted by said boosting means;
piezo-electric means;
driven means including a shutter connected to be actuated by said piezo-electric means and serving also as an aperture diaphragm;
driving and controlling means for driving and controlling said piezo-electric means by energy accumulated in said charging means;
exposure amount controlling means for controlling said shutter to open until an appropriate exposure amount is obtained and then to close when a position in which the appropriate exposure amount is obtained is reached;
opening aperture diameter detecting means for producing a detection signal when aid opening aperture diameter detecting means detects that the diameter of an opening of said shutter reaches a predetermined diameter; and
controlling means for inhibiting a closing operation of said shutter by said exposure amount controlling means until said detection signal is produced from said opening aperture diameter detecting means.

4,963,917

PHOTOGRAPHIC CAMERA

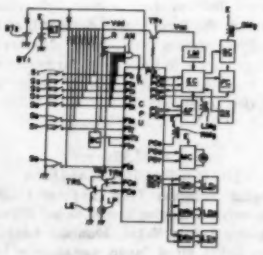
Nobuyuki Taniguchi; Yoshiaki Hata, both of Nishinomiya; Manabu Inoue, Kobe; Yoshinobu Kudo, Sakai; Takeo Hoda, Kawachinagano, and Hiroshi Ueda, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 203,508, Jun. 7, 1988, Pat. No. 4,862,201, which is a continuation of Ser. No. 928,025, Nov. 7, 1986, abandoned. This application Apr. 11, 1989, Ser. No. 336,416

Claims priority, application Japan, Nov. 11, 1985, 60-252473; Nov. 11, 1985, 60-252474

Int. Cl.[5] G03B *7/26*

U.S. Cl. 354—484 **2 Claims**



1. A camera comprising:
a microcomputer for controlling photographing operations and for producing chronometric data;
a main battery for supplying electric power to said microcomputer;
a back-up battery for supplying electric power to said microcomputer when the voltage level of the main battery is insufficient or when said main battery is removed from said camera; and
means responsive to said microcomputer for recording chronometric data on a medium which is to record an image of an object;
wherein said microcomputer includes means for controlling a sequence of photographing operations, means for detecting the insufficiency of the voltage of said main battery or the absence of said main battery, means for producing the chronometric data, means for controlling said recording means to record said chronometric data on the recording medium, and control means responsive to said detecting means for both controlling the means for controlling the sequence of photographing operations and for controlling the means for producing the chronometric data when the voltage of said main battery is sufficient, whether or not electric power from the back-up battery is available, and for controlling only the means for producing the chronometric data when the voltage of said main battery is insufficient or when said main battery is absent.

4,963,918

IMAGE FORMING APPARATUS FOR REPRODUCING IMAGES ON PHOTOSENSITIVE MEDIUM BY EXPOSING THE MEDIUM TO RADIATION THROUGH IMAGE-BEARING ORIGINAL

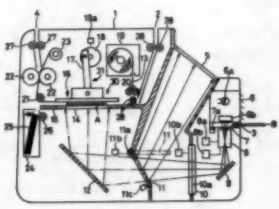
Hideo Yoshihara, Kasugai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sep. 1, 1988, Ser. No. 239,269

Claims priority, application Japan, Sep. 3, 1987, 62-220978; Sep. 10, 1987, 62-138778

Int. Cl.[5] G03B *27/00*

U.S. Cl. 355—19 **10 Claims**



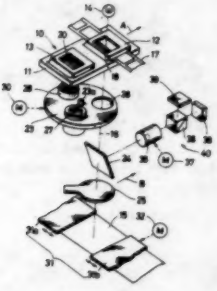
1. An image forming apparatus, comprising:
first holding means for positioning and holding a photosensitive recording medium at an exposing position;
single light source for generating a radiation for exposing said recording medium;
second holding means for positioning and holding a contact-exposure original bearing a first image thereon, substantially in contact with said recording medium,
third holding means for positioning and holding a focus-exposure original bearing a second image thereon;
means for defining an optical path between said exposing position and said light source, both of said second holding means and said third holding means being disposed in said optical path; and
said means for defining an optical path including a projector lens disposed in a portion of said optical path between said third holding means and said exposing position, such that said recording medium is imagewise exposed to said radiation which has passed through said projector lens and which has been influenced by at least one of said contact-exposure and focus-exposure originals, said radiation influenced by said contact-exposure original irradiating said recording medium for effecting a contact-exposure imaging of said first image, said radiation influenced by said focus-exposure original being focused by said projector lens on said recording medium, for effecting a focus-exposure imaging of said second image.

4,963,919

METHOD OF SIMULATING THE LAYOUT OF COMPOSED IMAGE

Fumio Matsumoto, Tokyo, and Kenji Suzuki, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 20, 1989, Ser. No. 368,735
Claims priority, application Japan, Jun. 20, 1988, 63-151833
Int. Cl.[5] G03B 27/52
U.S. Cl. 355—40 4 Claims



1. A method of making a composed image on a photographic paper from two complementarily covered originals in a double exposure, comprising the steps of:

displaying lines defining a square area in accordance with a printing magnification on a monitor screen;

placing one of said two complementarily covered originals in a printing station of a printer so as to display an image of said one complementarily covered original in said square area on said monitor screen, so as to simulate a proper layout of said displayed image of said one complementarily covered original for framing;

making an exposure of said one complementarily covered original to a photographic paper;

placing the remaining complementarily covered original in said printing station of said printer so as to display an image of said remaining complementarily covered original in said square area on said monitor screen, so as to simulate a proper layout of said remaining complementarily covered original for framing; and

making an exposure of said remaining complementarily covered original to said photographic paper.

4,963,920

COPYING APPARATUS HAVING FUNCTION OF IMPRINTING DATA

Shigenobu Fukushima, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 2, 1989, Ser. No. 388,691
Claims priority, application Japan, Aug. 2, 1988, 63-193233; Aug. 2, 1988, 63-193234; Aug. 2, 1988, 63-193235; Aug. 2, 1988, 63-193236; Aug. 23, 1988, 63-208691; Aug. 23, 1988, 63-208692; Sep. 19, 1988, 63-234290; Sep. 21, 1988, 63-237085; Sep. 21, 1988, 63-237086; Sep. 21, 1988, 63-237087
Int. Cl.[5] G03B 27/52
U.S. Cl. 355—40 26 Claims

1. A copying apparatus for imprinting page data together with an image of an original document on a copy sheet comprising:

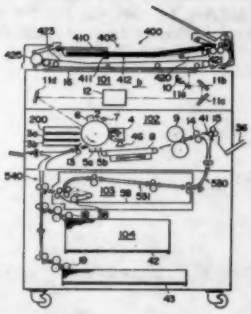
original document feeding means for sequentially supplying original documents from an original document setting tray to an original document setting table and collecting the original documents from the original document setting table;

original document count instructing means for actuating said original document feeding means before the image of each of the original documents is copied on a copy sheet;

count means for counting the number of all original documents fed by said original document feeding means according to the instruction of said original document count instructing means;

image forming means for forming the image of each of the original documents supplied to the original document setting table on a copy sheet corresponding to each of the original documents;

page data controlling means for generating page data to be imprinted on each of copy sheets corresponding to each of the original documents according to the number of the original documents counted by said count means;



page data imprinting means for imprinting on the copy sheet data generated by said page data controlling means and the image of each of the original documents formed by said image forming means;

selecting means for selecting a page data imprinting mode using said page data imprinting means; and

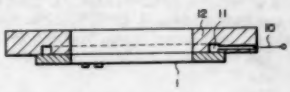
cancelling means for cancelling a selected page data imprinting mode when said instructing means does not generate the instruction.

4,963,921

DEVICE FOR HOLDING A MASK

Takao Kariya, Hino, and Hidehiko Fujioka, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 151,978, Feb. 3, 1988, and a continuation-in-part of Ser. No. 140,900, Dec. 23, 1987, and a continuation-in-part of Ser. No. 875,986, Jun. 19, 1986, abandoned. This application Feb. 21, 1989, Ser. No. 312,761
Claims priority, application Japan, Jun. 24, 1985, 60-135942; Jun. 24, 1985, 60-135943; Jun. 24, 1985, 60-135944; Jun. 24, 1985, 60-094416; Feb. 9, 1987, 62-026456
Int. Cl.[5] G03B 27/42
U.S. Cl. 355—53 15 Claims



1. A mask holding device for use in an exposure apparatus, for detachable holding a mask, said device comprising:

holding means comprising a mask holding surface for the mask to be held, said holding means further comprising attracting means for attracting the mask to said mask holding surface;

driving means comprising means for moving the mask toward said mask holding surface;

position detecting means for detecting the position of the mask and for producing a signal when the mask contacts or is in close proximity to said mask holding surface; and

control means for controlling said attracting means for producing a mask attracting force in response to the signal produced by said position detecting means.

4,963,922

COPYING APPARATUS

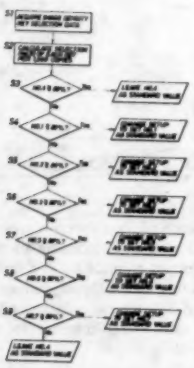
Haruo Itakura, and Kunio Ito, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Aug. 16, 1989, Ser. No. 394,584

Claims priority, application Japan, Aug. 20, 1988, 63-206613

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—208 **3 Claims**



1. A copying apparatus comprising:

copy condition setting means for setting copy conditions such as a copy count, a copy density, and a magnification;

standard mode setting means for initially setting the copy conditions upon starting of said apparatus to predetermined initial values;

frequency calculating means for calculating a setting frequency of each copy condition set by said copy condition setting means and said standard mode setting means; and

correction means for, when the frequency calculated by said frequency calculating means exceeds a predetermined value, correcting the initial value to the corresponding copy condition.

4,963,923

MICROFILM PROJECTING APPARATUS

Hideaki Kusano, Osaka, and Masaaki Ito, Yokohama, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 326,297, Mar. 21, 1989, abandoned. This application Mar. 14, 1990, Ser. No. 494,944

Claims priority, application Japan, Mar. 23, 1988, 63-69116

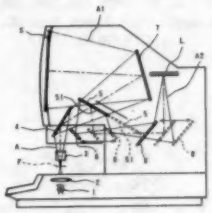
Int. Cl.[5] G03B *27/74, 27/80, 13/28*

U.S. Cl. 355—68 **11 Claims**

1. A microfilm projecting apparatus for projecting an image of a microfilm on a screen and projecting the same on a photoreception means, comprising:

a reflector being movably provided between a first position out of an image projecting light path and a second position in said image projecting light path, and being movable from the first position to the second position along a plane including the reflecting surface thereof, for reflecting the image projecting light to said photoreception means at said second position,

said image projecting light traveling to the screen while the reflector is at said first position; and



detecting means for detecting the density of the image by receiving the image projecting light reflected by said reflector while said reflector is moving from the first position to the second position.

4,963,924

LINEWIDTH LOSS MEASUREMENT

Michael D. Gill, Ipswich; David W. J. Blackburn, Bury St. Edmunds, and Malcolm P. Saunders, Ipswich, all of England, assignors to British Telecommunications plc, London, England

Filed May 8, 1989, Ser. No. 348,530

Claims priority, application United Kingdom, May 17, 1988, 8811678

Int. Cl.[5] G03B *27/32*

U.S. Cl. 355—77 **5 Claims**

1. A method of measuring linewidth loss during the formation of microelectronic circuitry, the method comprising the steps of:

(a) forming a test pattern comprised of a series of spaced bars on a photographic mask which is to be used to form a predetermined pattern on a substrate material, one of the bars or the gaps between the bars having the same predetermined width, and the other of the bars or the gaps having widths which differ incrementally stepwise from one to the next, the series of bars being such that the ratio of the widths of one adjacent bar/group pair is unity;

(b) inspecting the resultant pattern which is formed on the substrate as a complement of the test pattern;

(c) noting the position where the bar/gap width ratio of the resultant pattern is unity; and

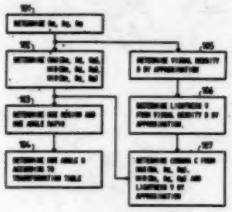
(d) calculating the linewidth loss from a knowledge of the size of the incremental step and the position of the bar/gap width ratio unity point on the resultant pattern.

4,963,925

CHROMA CONTROL METHOD

Koichi Miyazaki, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 23, 1989, Ser. No. 355,614
Claims priority, application Japan, May 24, 1988, 63-127615
Int. Cl.[5] G03B 27/32
U.S. Cl. 355—77 2 Claims



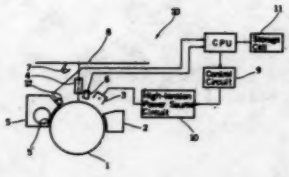
1. A method of chroma control comprising the steps of:
reading information on a color original;
transforming the density of each of three original colors, red, green and blue, to an associated hue, lightness and chroma;
controlling said chroma;
combining the controlled chroma with said hue and lightness;
transforming the combinations to colorant densities; and
outputting a color image based on said colorant densities.

4,963,926

ELECTROSTATIC IMAGE FORMING APPARATUS WITH CHARGE CONTROLLER

Kunihiro Onishi; Akihiro Takada, both of Osaka, and Kaneyuki Sakamoto, Nara, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed May 8, 1989, Ser. No. 348,994
Claims priority, application Japan, May 12, 1988, 63-115073; Aug. 31, 1988, 63-218886; Nov. 30, 1988, 63-303071; Feb. 22, 1989, 1-42583
Int. Cl.[5] G03G 21/00, 15/02
U.S. Cl. 355—203 3 Claims



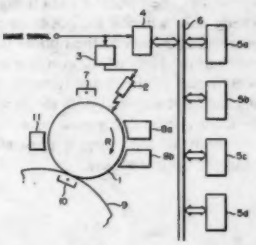
1. An electrostatic image forming apparatus in which a photo conductor is charged by an electrifier provided in the vicinity of the photo conductor rotating, an electrostatic latent image is formed by projecting light to said charge, and said electrostatic latent image is developed into a toner image by applying toner thereto at a developing section, said apparatus comprising:
voltage adjusting means for applying first and second voltages (V_1, V_2) to charge said electrifier in order to charge first and second positions on a surface of said photo conductor,
electric potential detecting means for detecting electric potentials (E_1, E_2) at said first and second positions on the surface of a photo conductor that corresponds to the first and second voltages (V_1, V_2) by means of a single surface electric potential sensor installed in the neighborhood of a surface of the photo conductor,
potential difference detecting means for detecting a potential difference (ΔE) between said second electric potential and a third electric potential on a surface of said photo conductor detected at said second position when said photo conductor is stopped for a predetermined time, and
voltage computing means for calculating the voltage to be applied to said electrifier according to said first and second voltages (V_1, V_2), said detected first and second electric potentials (E_1, E_2) and said potential difference (ΔE) whereby said surface charge on said photo conductor is adjusted to a required amount.

4,963,927

ELECTROPHOTOGRAPHIC RECORDING APPARATUS HAVING A DEVELOPER RESUPPLY CONTROL FUNCTION

Hideshi Ishihara, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 3, 1988, Ser. No. 189,945
Claims priority, application Japan, May 11, 1987, 62-114108; Dec. 25, 1987, 62-330808
Int. Cl.[5] G03G 15/06; B05C 11/00
U.S. Cl. 355—207 9 Claims



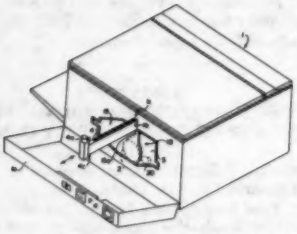
1. An electrophotographic recording apparatus, comprising:
means for detecting a shortage of a developer;
means for detecting a deterioration of the developer; and
means for outputting a signal indicating a need to resupply the developer when the shortage or deterioration of the developer has been detected;
said means for detecting the shortage of developer comprising:
a counter for counting the number of illuminated dots or the number of non-illuminated dots in an image signal;
means for sending the image signal to exposing means and also to said counter;
a CPU for reading out a count value of said counter at predetermined periods and integrally adding up the read-out count values, comparing the integration result of the count values with a predetermined value, and deciding that the developer contained in a developing means is insufficient, when the integration result of the count values exceeds the predetermined value;
means for storing the integration result of the count values; and
means for storing the predetermined value, wherein said CPU is interrupted by a signal indicative of the most significant bit of said counter, said CPU counts the number of interruption times and compares the interruption time count value with a predetermined value which has been set beforehand, and when the interruption time count value exceeds the predetermined value, the CPU outputs a signal representing a shortage of the developer contained in said developing means.

4,963,928

ELECTROPHOTOGRAPHIC COPYING APPARATUS EQUIPPED WITH POSITIONING DEVICE

Syoichiro Yoshiura, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1988, Ser. No. 279,413
Claims priority, application Japan, Dec. 4, 1987, 62-307125
Int. Cl.[5] G03G 15/00
U.S. Cl. 355—210 7 Claims



1. An electrophotographic copying apparatus equipped with positioning devices, the copying apparatus comprising an optical means detachably mounted on the body of the copying apparatus, and an image-forming unit detachably mounted on the copying apparatus, the optical means being engaged with the image-forming unit, wherein the positioning devices comprise a first positioning means of the optical means, a second positioning means of the body of the copying apparatus, and a third positioning means of the image-forming unit so that the first positioning means is engaged with the second positioning means and the third positioning means so as to constitute an assembly of the body of the copying apparatus, the image-forming unit and the optical means.

4,963,929

CLEANING DEVICE FOR TONER DETECTING SENSOR

Masahide Ueda, and Masao Tokumoto, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

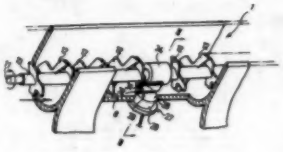
Continuation of Ser. No. 227,991, Aug. 3, 1988, abandoned. This application Feb. 9, 1990, Ser. No. 478,740
Claims priority, application Japan, Aug. 5, 1987, 62-195626; Aug. 5, 1987, 62-195627
Int. Cl.[5] G03G 21/00
U.S. Cl. 355—215 22 Claims

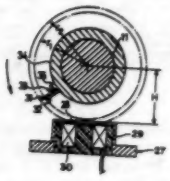
1. A cleaning device for a toner detecting sensor, comprising:

a rotating shaft disposed to oppose the surface of the toner detecting sensor;

a first blade for cleaning toner disposed in the radial direction to the rotating shaft, having a width in the direction of the shaft, shorter in length than the distance between the rotating shaft and the surface of the sensor and possessing elasticity; and

a second blade for cleaning toner disposed adjacent to the first blade in the radial direction to the rotating shaft, having a width in the direction of shaft, longer in length





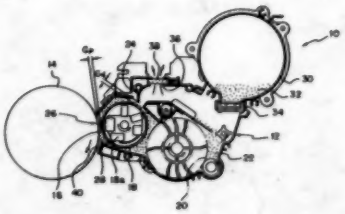
than the distance between the rotating shaft and the surface of the sensor and posseasing elasticity.

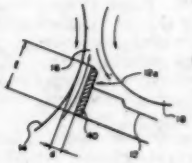
4,963,930

DEVELOPING APPARATUS CAPABLE OF PREVENTING LEAKAGE OF A DEVELOPER

Akito Yoshimaru, and Yoichiro Sugino, both of Kawasaki, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 9, 1989, Ser. No. 391,047
Claims priority, application Japan, Aug. 29, 1988, 63-112156[U]; Jun. 2, 1989, 1-139175
Int. Cl.[5] G03G 21/00
U.S. Cl. 355—215 4 Claims





1. A developing apparatus for developing a latent image electrostatically formed on an image carrier by using a dry developer, comprising:

a housing having an opening which faces the image carrier;

a developing sleeve disposed in said housing and in close proximity to said opening for transporting the dry developer being deposited thereon to a developing position between the image carrier and said opening, said dry developer developing the latent image at said developing position through said opening;

a vent formed through said housing for releasing a pressure being developed in said housing;

a filter closing said vent for preventing the dry developer from flowing out through said vent; and

an air guide plate having a predetermined width and provided in an edge portion of said opening which is located downstream of the developing position with respect to an intended direction of movement of the image carrier at said opening of said housing, said air guide plate being spaced apart from said image carrier by a predetermined distance for sucking air through said opening, wherein the predetermined width of said air guide plate is at least 5 millimeters.

4,963,931

REGULATING MEANS FOR AUTOMATICALLY ADJUSTING A MARGINING MEANS IN A COPIER TO PRODUCE IMAGE-FREE IMAGE CARRIER ZONES IN RESPONSE TO IMAGE POSITIONING PRIOR TO IMAGE TRANSFER

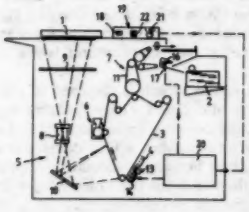
Adrianus de Jong, EK Horst, and Hendrikus J. J. van Soest, AP Helden, both of Netherlands, assignors to OCE Nederland B.V., Venlo, Netherlands

Filed Jul. 30, 1986, Ser. No. 891,962

Claims priority, application Netherlands, Aug. 5, 1985, 8502186

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—218 **3 Claims**



1. In a copying machine having margining means for rendering zones adjacent to an image image-free and adjustment means for the adjustment of the relative position of said image and image receiving material with respect to each other before transferring said image to said receiving material, the improvement in combination therewith comprising regulating means for adjusting said margining means so as to also render image-free the zone of the image which during the image transfer falls outside said receiving material.

4,963,932

MULTI-DOCUMENT EDITING

Jeno L. Horvath, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 11, 1989, Ser. No. 405,267

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—218 **12 Claims**

1. A copy system, including:

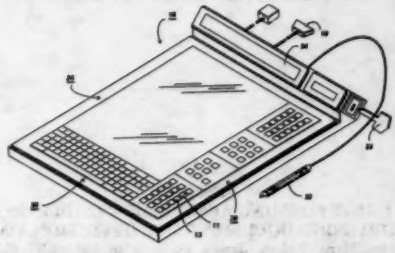
input means for inputting an editing condition for image editing at least one original document of a set of original documents;

page designating means associated with said input means for designating each original document edited by said input means in the set of original documents;

a copying machine;

image forming means installed in said copying machine for forming a copy image of each original document advanced thereto; and

document moving means associated with said copying machine for moving each original document of the set of



original documents to said image forming means, said image forming means forming a copy image of each original document of the set of original documents with said image forming means being responsive to said input means and said page designating means for forming a copy image of each original document edited in accordance with the editing condition from said input means.

4,963,933

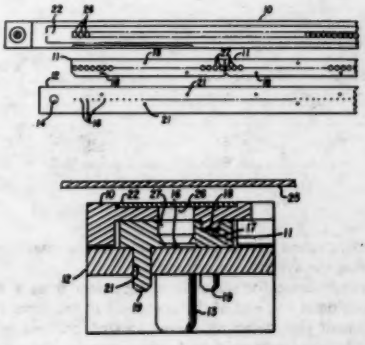
LED ILLUMINATOR BAR FOR COPIER

Kenneth G. Brownlee, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 5, 1988, Ser. No. 253,714

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—218 **47 Claims**



1. An illumination bar for a xerographic printer or the like comprising:

a plurality of light sources in a row, each light source illuminating a separate area along the length of the illumination bar, adjacent illuminated areas being located so that the illumination along the length of the illumination bar is approximately uniform; each of the light sources comprising:

a cavity open at an end facing in the direction of illumination by the illumination bar and closed at the opposite end;

a light emitting diode at the closed end of the cavity for

emitting radiation in directions transverse to the direction of illumination by the illumination bar;

a concave reflective wall at the closed end of the cavity for reflecting a major portion of the light emitted by the light emitting diode in a direction toward the open end of the cavity; and

occultation means between the reflective walls and the open end of the cavity for defining the shape of an image projected from the open end of the cavity.

4,963,934

IMAGE FORMING APPARATUS CAPABLE OF SHORTENING DOCUMENT SIZE DETECTION TIME

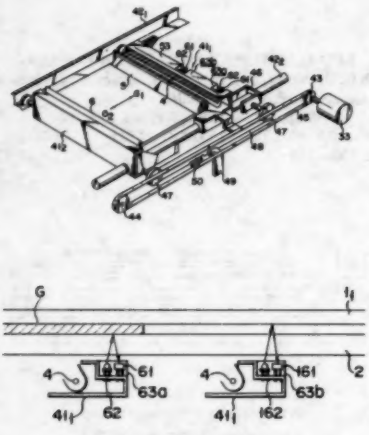
Yukihiro Nezu, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 20, 1989, Ser. No. 326,000

Claims priority, application Japan, Mar. 23, 1988, 63-68386; Apr. 30, 1988, 63-108463

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—235 16 Claims



1. A document size detection system for an image forming apparatus, the system comprising:

scanning means for scanning a document from a starting position at one end of the document to the other end;

document size detecting means located on, and movable with, the scanning means, for detecting the document size;

actuating means for moving the document size detecting means from a home position through a plurality of document size detecting positions to the scan starting position;

means for determining whether the document is present at the home position and, accordingly, controlling the direction of movement of the document size detecting means, the direction of movement initially being away form the starting position if the document is present at the home position and initially toward the starting position if it is not present; and

means for computing the size of the document from optical signals received by the detecting means.

4,963,935

COPYING APPARATUS

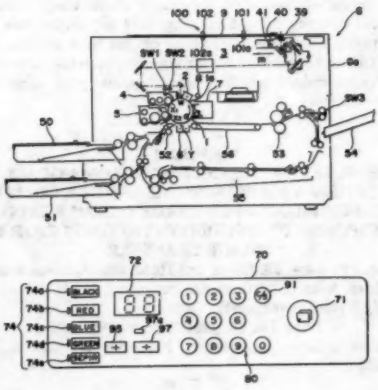
Yoichi Kawabuchi, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 265,515, Nov. 1, 1988, abandoned. This application Nov. 8, 1989, Ser. No. 432,391

Claims priority, application Japan, Nov. 2, 1987, 62-277850

Int. Cl.[5] G03G *15/06*

U.S. Cl. 355—245 4 Claims



1. A copying apparatus comprising:

an electrostatic latent image holding member rotatively supported in the housing of the copying apparatus;

means for exposing an image so as to form an electrostatic latent image on said electrostatic latent image holding member;

a developing means which is disposed in the periphery of said electrostatic latent image holding member in the housing of the copying apparatus, and has at least a first developing unit housing a first developer and a second developing unit housing a second developer different in the color thereof from the color of the first developer housed in the first developing unit;

a switching means for switching a copy mode from a first mode in which a monochrome copying operation is carried out by selecting any one of the developing units to a second mode in which a plural color copying operation is carried out during one image exposure operation and vice versa;

a developing unit selection means for selecting and specifying any one of the developing units; and

an inhibiting means for inhibiting the selection of the developing unit when the second mode is specified by said switching means.

4,963,936

DEVELOPER UNIT MOUNTING APPARATUS

Stephen W. Carter, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 5, 1989, Ser. No. 446,346

Int. Cl.[5] G03G *15/06, 15/09*

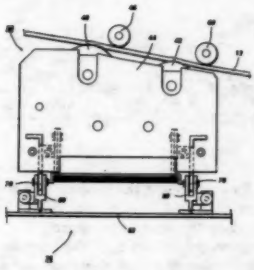
U.S. Cl. 355—245 5 Claims

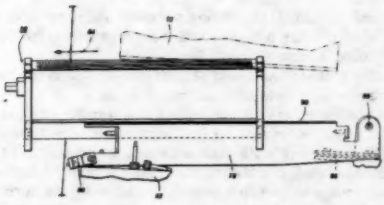
1. An apparatus for developing a latent image recorded on a photoconductive member, including:

a developer unit positioned, in an operative position, adjacent the photoconductive member; and

means for supporting said developer unit slidably and pivotably so that said developer unit may be pivoted from the

operative position to a non-operative position and be slidably removed from said supporting means, said supporting means includes a frame, a pair of rails spaced from one another for supporting said developer unit and having one end thereof mounted pivotably on said frame, and a support bracket mounted rotatably on the other end of





each of said pair of rails and supporting the other end of said pair of rails on said frame, said support bracket being adapted to rotate from a first position maintaining said pair of rails substantially horizontal when said developer unit is positioned in the operative position to a second position maintaining said pair of rails in an inclined position when said developer unit is in the non-operative position.

4,963,937

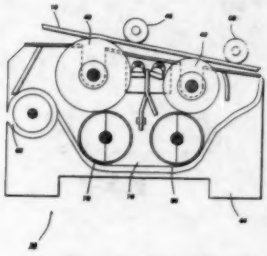
DEVELOPMENT APPARATUS

Elizabeth D. Diehl, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 17, 1989, Ser. No. 324,794

Int. Cl.[5] G03G *15/09*

U.S. Cl. 355—251 **12 Claims**



1. An apparatus for developing with developer material a latent image recorded on a belt extending in a direction transverse to a horizontal plane, including:

a housing defining a chamber for storing a supply of developer material;

at least two developer rollers mounted, at least partially, in the chamber of said housing for transporting developer material to the belt so as to develop the latent image recorded thereon with each of said developer rollers being closely adjacent the belt, said developer rollers being spaced from one another and having different diameters with the spacing between each of said developer rollers and the diameters of each of said developers being selected so that a plane tangential to the lower periphery both of said developer rollers is substantially parallel to the horizontal plane.

4,963,938

TONER CARTRIDGE FOR AN IMAGE FORMING APPARATUS

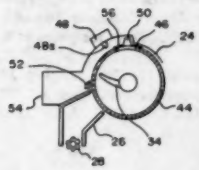
Yoshihide Sonoda, Tokyo; Yasuji Takagi, Matsudo, and Kouji Ishigaki, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 363,766

Claims priority, application Japan, Jun. 10, 1988, 63-77062[U]; Jun. 10, 1988, 63-77063[U]

Int. Cl.[5] G03G *15/08, 15/00*

U.S. Cl. 355—260 **7 Claims**



1. A toner cartridge for a developing unit having a cartridge container for accommodating said toner cartridge, and a cartridge sensor associated with said cartridge container for sensing that said toner cartridge has been set in said cartridge container, said toner cartridge comprising:

a member for actuating said cartridge sensor when said toner cartridge is set in said cartridge container; and

preventing means for preventing, after said member has actuated said cartridge sensor, said member from actuating said cartridge sensor again;

wherein said member comprises a lug extending out from an outer periphery of said toner cartridge, said cartridge sensor comprising a switch with which said lug is engageable, said preventing means comprises inhibiting means for inhibiting said lug from engaging said switch, and said inhibiting means comprises a cutter for cutting of with complete removal said lug after said lug has engaged said switch.

4,963,939

CARTRIDGE DISCRIMINATING SYSTEM

Shigeo Kurando; Yoshinori Makiura; Yutaka Shigemura; Junichi Oours; Eiji Mifune, all of Osaka; Tatsuo Imafuku, Kagoshima; Hiroshi Komata, Hyogo, and Mikio Ido, Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Sep. 21, 1987, Ser. No. 99,118

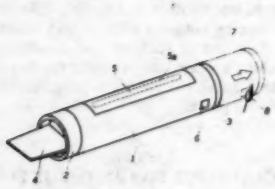
Claims priority, application Japan, Sep. 24, 1986, 61-226383; Sep. 27, 1986, 61-228869; Sep. 27, 1986, 61-228870; Sep. 27, 1986, 61-228871; Sep. 30, 1986, 61-234104

Int. Cl.[5] G03G *15/08*

U.S. Cl. 355—260 **11 Claims**

1. A cartridge discriminating system in which while a cartridge indicating means is provided on a part of a toner housing cartridge, an indication detecting means for detecting the aforementioned cartridge indicating means is provided on the

image forming apparatus proper side, so that the suitability of the type or position of the cartridge inserted is detected by detecting the cartridge indicating means by the aforementioned detecting means, when the cartridge has been inserted



into the cartridge inserting part of the image forming apparatus proper and wherein the cartridge indicating means is a magnetic card and the cartridge indication detecting means is a magnetic head.

4,963,940

TONER CARTRIDGE FOR A COPYING APPARATUS

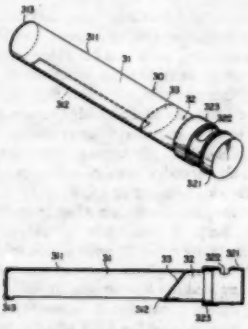
Mitsugu Nemoto; Atsuo Ohmura; Jun-ichi Koiso, and Kohji Ishii, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 19, 1989, Ser. No. 382,728

Claims priority, application Japan, Jul. 22, 1988, 63-182857

Int. Cl.[5] G03G *15/06, 21/00*

U.S. Cl. 355—260 **3 Claims**



1. A toner cartridge for supplying toners to a developer and collecting a waste portion of toner after a copying operation, said cartridge comprising:

a cylindrical body,

a separating wall inside said body thereby dividing said body into a supply toner container and a waste toner collector;

an outlet on a curved wall of said body at a side of said supply toner container whereby toner is supplied to said developer through said outlet;

an inlet on said curved wall at the side of said waste toner collector whereby said waste portion of toner is introduced into said waste toner collector through said inlet after said copying operation,

said outlet and said inlet are on opposite sides of said curved wall, and said separating wall means is angled so that one length of a first side of said collector on which said inlet is located is shorter than another length of a second side of said collector opposite said first side.

4,963,941

PORM FEEDING CONTROL DEVICE

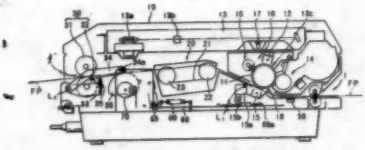
Kiyoshi Negishi; Ikuo Negoro, and Masahiro Kita, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1989, Ser. No. 434,104

Claims priority, application Japan, Nov. 14, 1988, 63-286992

Int. Cl.[5] G03G *15/20*

U.S. Cl. 355—282 **8 Claims**



1. A device for controlling the feeding of a continuous form provided in a printer, said device comprising:

means for feeding the continuous form;

means for sensing the existence of the continuous form in an inlet mouth through which the continuous form is supplied;

a transfer unit for transferring a printed image by an electrophotographing process to the continuous form fed by said feeding means;

a fixing unit for fixing said printed image transferred by said transfer unit onto the continuous form;

first control means for controlling said transfer unit to transfer a printed image to a first page of the continuous form when printing data corresponding to said first page is accumulated, controlling said fixing unit to fix said printing image to said first page of said continuous form, and controlling said transfer unit to transfer a printed image to a second page of the continuous form following said first page when printing data corresponding to said second page is accumulated; and

second control means for controlling said fixing unit to fix a page of the continuous form to which a printed image has been transferred, when said sensing means senses that said continuous form does not exist is said inlet mouth.

4,963,942

FIXING DEVICE HAVING BLOWER FOR SUPPLYING A BLAST OF AIR

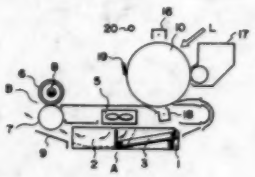
Fumitaka Aoki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1988, Ser. No. 232,170

Claims priority, application Japan, Aug. 20, 1987, 62-127053[U]

Int. Cl.[5] G03G *15/20*

U.S. Cl. 355—290 **12 Claims**



1. An image forming apparatus having:

containing means for containing therein support members;

means for forming unfixed images on the support members;

heat fixing means for fixing the unfixed images by applying heat thereto; and

blower means for supplying a blast of air to said heat fixing means;

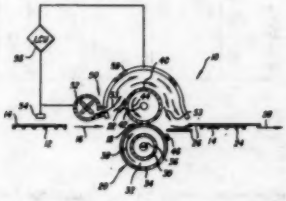
a portion of said containing means forming a part of the blast path for the air from said blower means.

4,963,943

FUSING APPARATUS HAVING A HEAT-DISSIPATING DEVICE

Ernest J. Tamary, Brighton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 21, 1989, Ser. No. 410,453
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—290 **9 Claims**



1. In an electrostatographic copier or printer, a fusing apparatus operable through a run period when toner images on a receiver or copy sheet are fused, using up a required and first amount of heat, and through a standby period when the apparatus is awaiting a run period, the apparatus including:

(a) a fusing member;

(b) means for heating said fusing member to a desired fusing temperature;

(c) a nip forming member in heat receiving relationship with said fusing member during both the run and standby periods;

(d) means for selectively dissipating a desired and second amount of heat from said nip forming member during standby periods in order to prevent "droop", or a dropping from the desired fusing temperature by causing heat flow from said fusing member to remain relatively constant during both run and standby periods; and

(e) means for selectively activating said heat dissipating means in timed relation to said apparatus beginning a standby period, and inactivating the same in timed relation to said apparatus beginning a run period.

4,963,944

RESIDUAL TONER CLEANING DEVICE FOR IMAGE FORMING APPARATUS

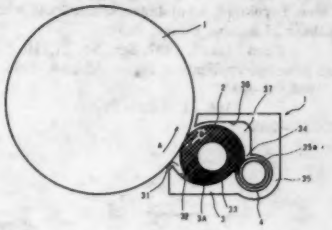
Keigo Tange, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 28, 1989, Ser. No. 372,901
Claims priority, application Japan, Jun. 30, 1988, 63-164201
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—298 **10 Claims**

1. A residual toner cleaning device for removing the residual toner on a photosensitive drum of an image forming apparatus comprising:

an elastic roller in contact with said photosensitive drum and rotatable to remove said residual toner from said photosensitive drum,

regulating means encompassing at least a portion of said elastic roller and having a compressing portion which compresses said elastic roller and a releasing portion for releasing said elastic roller from the compression to release the residual toner carried by said elastic roller, and



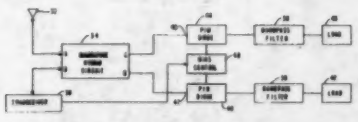
toner collecting means for collecting the toner released by said elastic roller.

4,963,945

BAND REJECTION FILTERING ARRANGEMENT

David M. Cooper, Wayne, and Gerald Lebleboojian, West Caldwell, both of N.J., assignors to Plessey Electronic Systems Corp., Wayne, N.J.

Filed Apr. 7, 1989, Ser. No. 334,431
Int. Cl.[5] H04B *1/44*
U.S. Cl. 455—307 **10 Claims**



1. A band rejection filtering arrangement comprising:

a quadrature hybrid circuit having a first pair of terminals and a second pair of terminals, said first pair of terminals being isolated from each other, said second pair of terminals being isolated from each other, signal transmissions between the first of said first pair of terminals and the first of said second pair of terminals being effected without phase shift, signal transmission between the first of said first pair of terminals and the second of said second pair of terminals being effected with a 90° phase shift, signal transmission between the second of said first pair of terminals and the second of said second pair of terminals being effected without phase shift, and signal transmission between the second of said first pair of terminals and the first of said second pair of terminals being effected with a 90° phase shift;

a first bandpass filter having its input coupled to the first of said second pair of terminals;

a second bandpass filter having its input coupled to the second of said second pair of terminals;

a first load coupled to the output of said first bandpass filter;

a second load coupled to the output of said second bandpass filter;

means for providing an input signal at the first of said first pair of terminals; and

means for receiving a signal at the second of said first pair of terminals;

wherein said first and second bandpass filters are tuned to pass the rejection band.

4,963,946

COPYING MACHINE CAPABLE OF DISCHARGING PAPER WITHOUT FORMING IMAGE THEREON

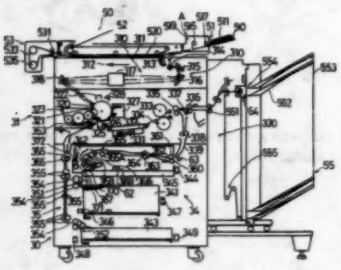
Syuzi Maruta, Toyokawa; Masazumi Ito, Toyohashi, and Tadashi Ohira, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

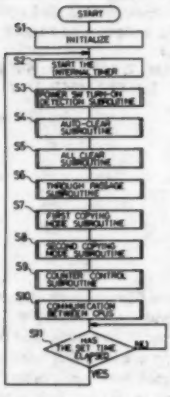
Filed Mar. 3, 1987, Ser. No. 21,210

Claims priority, application Japan, Mar. 4, 1986, 61-46859; Mar. 4, 1986, 61-46860

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—308 11 Claims





1. A copying machine comprising:

means for forming an image on a copying paper;

first copying paper feed means for containing copying papers to be subjected to the copying operation and for feeding the copying papers one by one to said image forming means;

second copying paper feed means for temporarily storing printed copying papers and for feeding the same copying papers one by one again to said image forming means;

means for designating a through passage mode;

means for detecting the presence of a copying paper or papers in said second copying paper feed means; and

means for discharging the copying paper or papers stored in said second copying paper feed means outside the copying machine while the operation of said image forming means is interrupted if said copying paper detecting means detects any copying paper in said second copying paper feed means in the through passage mode, and for discharging the copying paper or papers stored in said first copying paper feed means outside the copying machine while the operation of said image forming means is interrupted if said copying paper detecting means detects no copying paper in said second copying paper feed means in the through passage mode.

4,963,947

SEMICONDUCTOR ARRAY

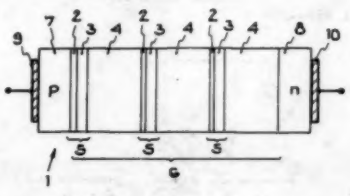
Heinz Beneking, Aachen, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Feb. 7, 1989, Ser. No. 307,255

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1988, 3804569

Int. Cl.[5] H01L *49/02*

U.S. Cl. 357—4 14 Claims



1. A semiconductor array having a semiconductor element containing several successive narrow layers which are alternately n-doped and p-doped, wherein said layers are arranged directly adjacent to one another in pairs and are separated from adjacent layer pairs by intermediate areas which are weakly doped compared with the doping of said layer pairs, wherein the extent of the intermediate areas is large in comparison with the thicknesses of the p- and n-layers of the layer pairs, wherein the layer pairs are an n^{++}-p^{+} layer sequence and wherein the intermediate areas are n^{-}-doped.

4,963,948

SEMICONDUCTOR DEVICE HAVING LEVEL SHIFT DIODE

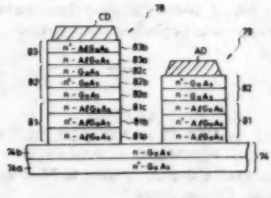
Yuji Awano, Tokyo, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 134,862, Dec. 18, 1987, abandoned. This application Aug. 22, 1989, Ser. No. 398,281

Claims priority, application Japan, Dec. 20, 1986, 61-302866

Int. Cl.[5] H01L *29/161*

U.S. Cl. 357—16 14 Claims



1. A diode having a stacked structure, comprising:

a first layer of a first compound semiconductor having a first electron affinity;

a second layer of a second compound semiconductor formed on said first layer and having a second electron affinity less than said first electron affinity, forming a first heterojunction between said first and second layers, said first and second compound semiconductors both comprising one of n-type and i-type semiconductor material;

a third layer comprising said first compound semiconductor with the first electron affinity and formed on said second layer, forming a second heterojunction between said second and third layers;

a first electrode formed on said first layer; and

a second electrode formed on said third layer, said first, second and third layers forming a bi-directional diode between said first and second electrodes.

4,963,949

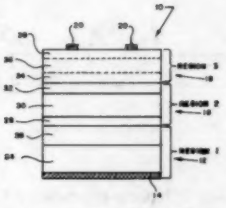
SUBSTRATE STRUCTURES FOR INP-BASED DEVICES

Mark W. Wanlass, Golden, and Peter Sheldon, Lakewood, both of Colo., assignors to The United States of America as represented of the United States Department of Energy, Washington, D.C.

Filed Sep. 30, 1988, Ser. No. 251,484

Int. Cl.[5] H01L *29/205, 31/06*

U.S. Cl. 357—16 **15 Claims**



1. A substrate structure for an InP based semiconductor device having an InP based film comprising:

substrate means including a light-weight bulk substrate and an upper GaAs layer; and

an interconnecting region disposed between said substrate means and said InP based device, said interconnecting region including a compositionally-graded intermediate layer substantially lattice matched at its one end to said GaAs layer and substantially lattice matched at its opposite end to said InP based film, said interconnecting region further including buffer means disposed between said GaAs layer and said InP based film in cooperation with said graded intermediate layer, said buffer means blocking and inhibiting propagation of threading dislocations between said substrate means and said InP based device.

4,963,950

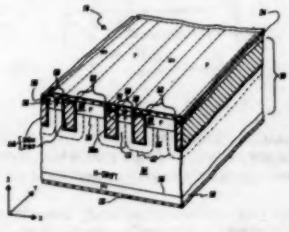
METAL OXIDE SEMICONDUCTOR GATED TURN-OFF THYRISTOR HAVING AN INTERLEAVED STRUCTURE

Hsueh-Rong Chang, Scotia, and Bantval J. Baliga, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 2, 1988, Ser. No. 188,887

Int. Cl.[5] H01L *29/10, 29/78, 29/74, 29/86*

U.S. Cl. 357—23.4 **22 Claims**



1. A semiconductor device comprising:

first and second power electrodes;

a body of semiconductor material having a first major surface and including a regenerative portion and a non-regenerative portion each connected between said first and second power electrodes, said regenerative portion including adjoining first, second, third and fourth regions of alternating conductivity type disposed in series in that order between said first and second power electrodes, said first power electrodes being disposed in ohmic contact with said first region and said second power electrode being disposed in ohmic contact with said fourth region;

an insulated gate electrode disposed adjacent said regenerative portion for pinching off one of said second and third regions in said regenerative portion in response to application of an appropriate gate bias voltage thereto, to thereby divert current from said regenerative portion into said non-regenerative portion of said device to turn said device off; and

in a plane parallel to said first major surface, said regenerative portion and said non-regenerative portion extending generally parallel to each other and at least part of said regenerative portion being bounded by said gate electrode and said gate electrode spaces at least part of said regenerative portion from an adjacent part of said non-regenerative portion.

4,963,951

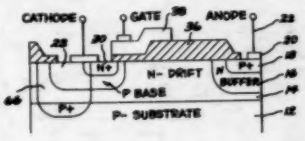
LATERAL INSULATED GATE BIPOLAR TRANSISTORS WITH IMPROVED LATCH-UP IMMUNITY

Michael S. Adler, and Deva N. Pattanayak, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 29, 1985, Ser. No. 803,049

Int. Cl.[5] H01L *29/74, 27/02, 29/80, 29/40*

U.S. Cl. 357—23.7 **6 Claims**



1. A lateral insulated gate bipolar transistor having a substantially planar upper surface comprising:

a substrate of one type conductivity;

a first layer of said one type conductivity disposed contiguous to said substrate;

a second layer of an opposite type conductivity disposed contiguous to said first layer and forming a portion of said upper surface of said device;

a first region of said opposite type conductivity disposed within said second layer and forming a portion of said upper surface of said device;

a second region of said one type conductivity disposed in said first region, spaced from said second layer and forming a portion of said upper surface;

a third region of said one type conductivity disposed within said second layer, spaced from said first region, forming a portion of said upper surface and having a basic doping concentration;

a fourth region of said opposite type conductivity disposed in said third region, forming a portion of said upper surface, spaced from said second layer to define a channel portion of said third region adjacent said upper surface between said fourth region and said second layer at the side of said fourth region toward said second region;

an insulation layer disposed on said upper surface of said device and covering a portion of said third and fourth regions including said channel portion of said third region;

a controllable gate electrode covering a portion of said insulation layer and aligned over at least said channel portion of said third region and responsive to an appropriate bias for inducing a channel in said channel portion of

said third region coupling said second layer to said fourth region;

a power electrode disposed over and in contact with portions of said third and fourth regions which are spaced from said channel portion of said third region and shorting said third region said fourth region to inhibit inadvertent forward biasing of the junction between said third and fourth regions; and

additional one type conductivity determining dopant disposed in the vicinity of said third region, said additional dopant establishing a buried region for increasing the conductivity for carriers of said one type conductivity in the vicinity of said third region away from said junction between said third and fourth regions to above that provided by said basic doping concentration of said third region to establish a current path for said carriers of said one type conductivity away from the portion of said third region which is adjacent to the portion of said junction along the surface of said fourth region which is remote from said upper surface; wherein said additional dopant comprises a buried layer located in said first and second layers to provide a high conductivity path of said one type conductivity spaced away from said junction between said third and fourth regions.

4,963,952

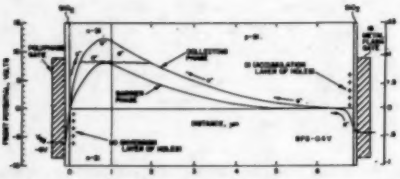
MULTIPINNED PHASE CHARGE-COUPLED DEVICE

James R. Janesick, La Canada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Mar. 10, 1989, Ser. No. 321,739

Int. Cl.[5] H01L *29/78, 27/14, 31/00*

U.S. Cl. 357—24 **7 Claims**



1. In a back-illuminated, buried-channel, multiphase charge-coupled device for imaging, said device having a buried n channel in a p layer and an insulating oxide layer between said buried channel and multiphase gates employed for control of integration and transfer of photogenerated charges, inversion means for reducing dark current generated at a front interface between said channel and said oxide layer due to surface states at said front interface by populating said front interface with free carrier holes, wherein said inversion means is implemented with a negative bias potential selectively applied by clocking to said multiphase gates during integration and transfer of charges, thereby pinning the surface potential of said front interface to a potential for inversion and positive ions implanted in said n channel at selected multiphase gates to create barrier phases within each pixel while multiphase clocks are applied to gates other than the selected gates for integration and transfer of photogenerated charges.

4,963,953

CHARGE TRANSFER DEVICE AND METHOD FOR PRODUCING SUCH A DEVICE

Pierre Blanchard, Echirolles, and Michel Carquet, Beziers, both of France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 920,446, Oct. 20, 1986, abandoned. This application Aug. 21, 1989, Ser. No. 396,797.

Claims priority, application France, Oct. 22, 1985, 85 15664

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—24 **2 Claims**

1. Method for producing a charge transfer device comprising the following different successive phases:

a first phase of producing a layer of insulating material on one face of substrate made of amorphous semi-conductor material;

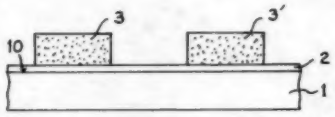
a second phase of depositing on the layer of insulating material a first layer of a conductive material;

a third phase of engraving in the said first layer of conductive material at least two lower electrodes separated by a space;

a fourth phase of producing on the lower electrodes a layer of an insulating material;

a fifth phase of producing on the assembly thus obtained a layer of a conductive material;

a sixth phase, in the layer of conductive material, deposited during fifth phase, of engraving the conductive material



produced in said fifth phase to produce a first upper electrode part covering a first portion of the space and a portion of one of the lower electrodes;

a seventh phase of producing a layer of the same material as during the fifth phase on the assembly of the first upper electrode part and the lower electrodes; and

an eighth phase of eroding or oxidizing the layer of conductive material produced in the seventh phase in order to produce a conductive second upper electrode part covering a remaining second portion of the space between the first upper electrode part and the layer of insulating material formed on the other lower electrode.

4,963,954

ARRANGEMENT FOR REDUCING PIEZOELECTRIC EFFECTS IN AN ELECTRICAL COMPONENT

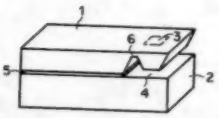
Beat Hälg, and Radivoje Popovic, both of Zug, Switzerland, assignors to LGZ Landis & Gyr Zug, Zug, Switzerland

Filed Apr. 19, 1989, Ser. No. 340,273

Claims priority, application Switzerland, Apr. 26, 1988, 1560/88

Int. Cl.[5] H01L *29/84, 29/96, 27/02*

U.S. Cl. 357—26 **14 Claims**



1. A combination comprising

a semiconductor body including a zone which is occupied by at least one component having an undesired piezo-electric effect,

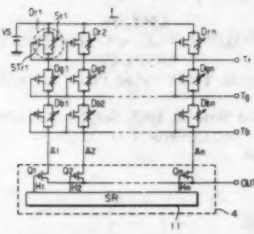
a support for said semiconductor body including a supporting surface to which said semiconductor body is attached, and

means for reducing said undesired piezo-electric effect in said at least one component by maintaining a space between said zone occupied by said at least one component having said undesired piezo-electric effect and said supporting surface to provide mechanical isolation for said component having said undesired piezo-electric effect.

4,963,955
PHOTOELECTRIC CONVERSION APPARATUS

Katsunori Hatanaka, Yokohama; Katsumi Nakagawa, Kawasaki; Masaki Fukaya, Yokohama, and Soichiro Kawakami, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 281,872, Dec. 7, 1988, abandoned, which is a continuation of Ser. No. 849,442, Apr. 8, 1986, abandoned. This application Sep. 1, 1989, Ser. No. 403,031
Claims priority, application Japan, Apr. 11, 1985, 60-75279
Int. Cl.[5] H01L *27/14, 45/00, 29/78*
U.S. Cl. 357—30 **5 Claims**



1. A photoelectric conversion apparatus comprising a plurality of blocks each of which further comprises:

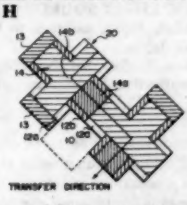
a plurality of photoelectric conversion elements having a dark resistance and a bright resistance and connected in series; and

a plurality of switching elements having an off-resistance and an on-resistance connected equivalently in parallel with and for short circuiting respective ones of said photoelectric conversion elements, wherein the off-resistances of said switching elements are substantially the same as, or more than, the dark resistances of said photoelectric conversion elements, and the on-resistances of said switching elements being about 100 to about 1000 times lower than the bright resistances of said photoelectric conversion elements, wherein at a time a particular photoelectric conversion element is to be read, the other photoelectric conversion elements connected to said particular photoelectric conversion element are short circuited via the respective switching elements, so that a signal is output by said particular photoelectric conversion element.

4,963,956
SOLID IMAGE PICKUP APPARATUS

Sohei Manabe, Yokohama; Yoshiyuki Matsunaga, Kamakura, and Nozomu Harada, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 17, 1988, Ser. No. 233,130
Claims priority, application Japan, Aug. 21, 1987, 62-206418
Int. Cl.[5] H01L *27/14, 31/00*
U.S. Cl. 357—30 H **12 Claims**



1. In a solid image pickup apparatus comprising:

a substrate;

a plurality of photo sensing semiconductor elements of a first conductivity type, arranged two-dimensionally on said substrate and spaced a specified distance apart from each other, for outputting electric charges on receiving a light;

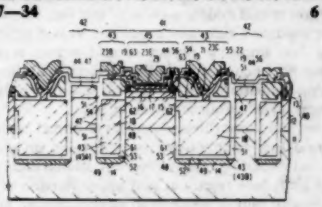
a semiconductor channel formed among said photo sensing elements and transferring electric charges output from said photo sensing semiconductor elements, said semiconductor channel comprising channel members arranged in stages, each channel member being of a second conductivity type and being located between four photo sensing elements; and

a plurality of vertical transfer electrodes, provided on said channel members, for applying an electric potential to said channel members and transferring electric charges to channel members of a next stage, the improvement in which each of said channel members comprises a wide-width part and a narrow-width part located between the wide-width part and the channel member of a next stage, said narrow-width part having a higher impurity concentration than that of the wide-width part.

4,963,957
SEMICONDUCTOR DEVICE HAVING BIPOLAR TRANSISTOR WITH TRENCH

Susumu Ohi; Masahiko Nakamae, and Hiroshi Shiba, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 29, 1988, Ser. No. 250,670
Claims priority, application Japan, Sep. 29, 1987, 62-247175
Int. Cl.[5] H01L *29/72, 27/12, 29/04, 23/48*
U.S. Cl. 357—34 **6 Claims**



1. A semiconductor device comprising a semiconductor substrate having an element forming region and an isolation region surrounding said element forming region, said semiconductor substrate including a semiconductor body of a first conductivity type having a flat upper face, a first impurity layer of a second conductivity type opposite to said first conductivity type formed on said upper face of said semiconductor body and a second impurity layer of said second conductivity type formed on said first impurity layer, said first impurity layer having an impurity concentration higher than an impurity concentration of said second impurity layer and said second impurity region having a major surface of said semiconductor substrate;

a trench formed in said element forming region of said semiconductor substrate from said major surface into said semiconductor body under said upper face thereof through said first and second impurity layers and surrounding an active region of said element forming region of said semiconductor substrate, said trench having a first side wall abutted to said active region, a second side wall facing to said first side wall and abutted to said isolation region, and a bottom so that said first side wall includes an upper section constituted of said second impurity layer of said active region, a middle section constituted of said first impurity layer of said active region and a lower section constituted of said semiconductor body, that said second side wall includes an upper section constituted of said second impurity layer of said isolation region, a middle section constituted of said first impurity layer of said isolation region and a lower section constituted of said semiconductor body, and that said bottom is constituted of said semiconductor body;

a base region of said first conductivity type formed in said second impurity layer of said active region of said semiconductor substrate from said major surface to a predetermined depth of said second impurity layer such that a remaining section of said second impurity layer between said base region and said first impurity layer serves as a collector region of said second conductivity type;

an emitter region of said second conductivity type formed in said base region at a center part of said major surface of said active region;

a graft base region of said first conductivity type having an impurity concentration higher than an impurity concentration of said base region, separated from said emitter

region and surrounding said emitter region, said graft base region being formed at a periphery part of said major surface of said second impurity layer of said active region;

a first insulating film formed on said first and second side walls and on said bottom of said trench, said first insulating film being absent on an upper portion of said upper section of said first side wall so that said graft base region is exposed and that said exposed graft base region surrounds said active region and absent on an upper portion of said middle section of said first side wall so that a part of said first impurity layer of said active region is exposed and that said exposed part of said first impurity layer surrounds said active region;

a first polycrystalline silicon layer doped with impurities of said second conductivity type and formed on said first insulating film within said trench, said first polycrystalline silicon layer filling a lower portion of said trench, facing said middle and lower sections of said second side wall via said first insulating film, facing said bottom via said first insulating film, facing said lower section and a lower portion of said middle section of said first side wall via said first insulating film, and contacted to said exposed part of said first impurity region of said active region at said upper portion of said middle section of said first said wall;

a second insulating film formed on said first polycrystalline silicon layer within said trench;

a second polycrystalline silicon layer doped with impurities of said first conductivity type, formed on said first and second insulating films within said trench and contacted to said graft base region at said upper portion of said upper section of said first side wall of said trench; and

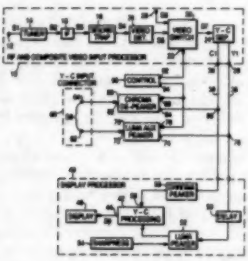
a means for leading-out said first polycrystalline silicon layer.

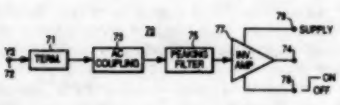
4,963,958

TELEVISION RECEIVER WITH AUXILIARY INPUT CONNECTOR PROVIDING A SECOND LUMINANCE SIGNAL SUBJECTED TO ENHANCING VIDEO SIGNALS OF A SEPARATED Y-C FORMAT

Gene K. Sendelweck, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Apr. 20, 1989, Ser. No. 341,095
Int. Cl.[5] H04N *5/445*
U.S. Cl. 358—37 **6 Claims**





1. Television apparatus comprising

a display processor having a luminance input coupled to a first video source via a first luminance peaking circuit and coupled to a second video source via a circuit path; and wherein:

said second video source is coupled via said circuit path to an input of said first luminance peaking circuit to which said first video source is coupled; and

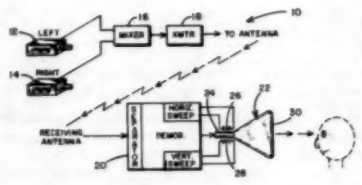
said circuit path includes a second luminance peaking circuit for subjecting a luminance signal provided by said second video source to peaking by the combination of said first and second peaking circuits.

4,963,959

THREE-DIMENSIONAL CATHODE RAY TUBE DISPLAY

Kenneth G. Drewlo, 14091 - 92nd Place North, Maple Grove, Minn. 55369

Filed Nov. 20, 1989, Ser. No. 438,000
Int. Cl.[5] H04N *13/00, 13/04*
U.S. Cl. 358—88 **6 Claims**



1. A cathode ray tube display for presenting three-dimensional images to a viewer, comprising:

(a) an evacuated glass tube having a cylindrical neck portion flaring out to a generally planar viewing screen, said screen having an inner face and an outer face;

(b) electron gun means contained in said neck portion;

(c) a linear lens having a plurality of vertically oriented prism surfaces adhered to said inner face of said screen; and

(d) a phosphor coating on said linear lens for emitting light when impacted by said beam of electrons, said linear lens directing the light in different diverging directions relative to the center of said viewing screen, depending upon the point on said linear lens being impacted by said beam of electrons.

4,963,960

ELECTRONIC ENDOSCOPE APPARATUS EMPLOYING AUTOMATIC LIGHT SOURCE CONTROL

Osamu Takami, Tochgi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 1, 1989, Ser. No. 360,156
Claims priority, application Japan, Jun. 1, 1988, 63-132822
Int. Cl.[5] A61B *1/06*
U.S. Cl. 358—98 **25 Claims**

1. An electronic endoscope apparatus comprising:

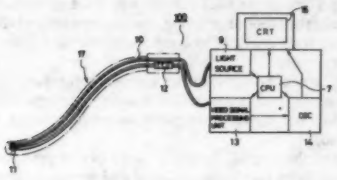
a light source for illuminating an interior portion of a biological body under medical examination;

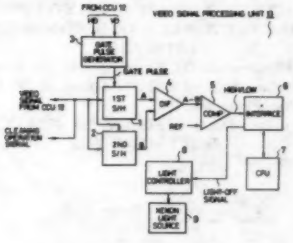
an image sensor means for imaging the illuminated interior portion of the biological body by receiving light reflected therefrom to produce an image signal;

means for converting the image signal into a corresponding video signal; and,

signal processing means for detecting that variations in levels of a light-source controlling basis signal are continued for a predetermined duration time to output a detection signal representing the difference between the video

signal and the basis signal, and for turning off the light source in response to the detection signal, said light-





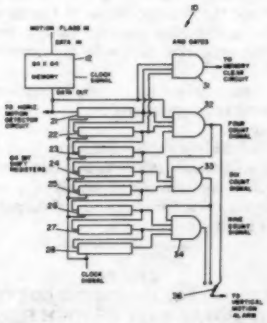
source controlling basis signal being produced in accordance with operation of the endoscope apparatus.

4,963,961

VERTICAL MOTION DETECTOR

Jon S. Willoughby, Oxford, and Erik D. Perkins, Lancaster, both of Pa., assignors to Burle Technologies, Inc., Wilmington, Del.

Filed Jun. 16, 1989, Ser. No. 368,378
Int. Cl.[5] H04N 7/18
U.S. Cl. 358—105 **6 Claims**



1. A vertical motion detector for a TV system comprising:

horizontal motion detector means generating horizontal motion signals indicating that horizontal motion has occurred on a TV display which the horizontal motion detector means is monitoring, said horizontal signals being produced on the output of said horizontal motion detector means as portions of a series of signal samples which represent elements of the TV display;

a shift register circuit comprising at least one shift register with an output, and with an input of said at least one shift register connected to the output of the horizontal motion detector means, each of said shift registers having the same number of locations within it as there are information samples available from the horizontal motion detector means to represent on horizontal line of the TV display which the horizontal motion detector means is monitoring;

clock signal means synchronized with the signal samples on the output of the horizontal motion detector means and connected to each shift register of said shift register circuit to produce one change of position in each shift register signal for every signal sample on the output of the horizontal motion detector means; and

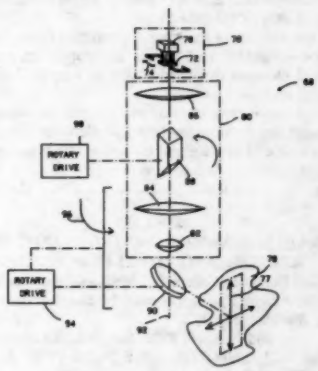
an AND gate circuit comprising at least one AND gate with inputs of said at least one AND gate connected to the output of the horizontal motion detector means and the output of a shift register of the shift register circuit, the output of said at least one AND gate producing a signal indicating vertical motion whenever the horizontal motion detector means generates a motion signal on its output simultaneous with an output signal from the shift register to which said at least one AND gate is connected.

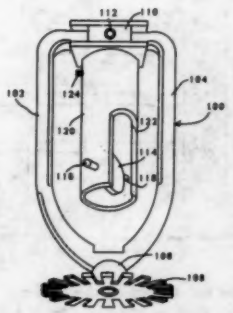
4,963,962

OPTICAL SURVEILLANCE ASSEMBLY AND CAMERA

Herman A. Kruegle, River Vale, and Walter T. Sandin, Old Tappan, both of N.J., assignors to Visual Methods, Inc., Westwood, N.J.

Filed Jan. 25, 1989, Ser. No. 301,657
Int. Cl.[5] H04N 7/18
U.S. Cl. 358—108 **20 Claims**





1. A covert surveillance camera assembly comprising:

a camera;

means for mounting said camera at a hidden location;
camouflage means for camouflaging said camera, said camouflage means including a facsimile of an object typically found adjoining said location;
means for mounting said camouflage means in a predetermined position relative to said camera;
a mirror rotatably mounted to said facsimile; and
scanning means for scanning an object area, said scanning means including means for rotating said mirror about an optical axis of the camera assembly.

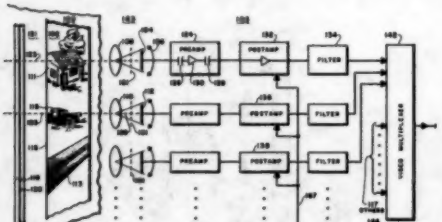
10. A surveillance camera assembly installable inside a ceiling for receiving light through a hole in said ceiling, said camera comprising:
a housing;
transducer means disposed in said housing for converting incoming electromagnetic radiation into electrical signals, said transducer means including a solid state image sensor;
mounting means for movably mounting said image sensor to said housing; and
shifting means operatively connected to said image sensor for reciprocating said image sensor along a linear path in a direction substantially transverse to the incoming electromagnetic radiation.

14. An assembly usable in combination with a surveillance camera installable inside a ceiling for receiving light through a hole in said ceiling, said assembly comprising in combination:
a casing;
light transmission means mounted to said casing for receiving incoming electromagnetic radiation;
first drive means operatively connected to said light transmission means for rotating said light transmission means at a predetermined angular speed in a first direction about an optical axis of the assembly;
means for stabilizing an image transmitted from an outlet end of the assembly, said means for stabilizing including an optical element disposed along said optical path in said casing; and
second drive means operatively connected to said optical element for rotating said optical element at one half said angular speed in a second direction about said optical axis opposite to said first direction.

4,963,963
INFRARED SCANNER USING DYNAMIC RANGE CONSERVING VIDEO PROCESSING

William J. Dorman, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 26, 1985, Ser. No. 705,836
Int. Cl.[5] H04N *5/33*; G02B *26/10*; H01L *25/00*
U.S. Cl. 358—113 **21 Claims**

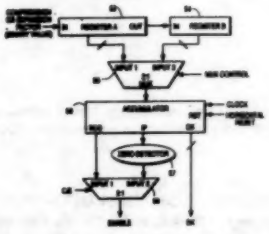


1. A method for decreasing the dynamic range of a scene video signal for processing said signal in a channel of limited dynamic range comprising the steps of:
including in the scene video signal at the point of origin thereof a pair of reference signals of predetermined video intensity difference,
separating the transient alternating current component of the video signal from the direct current reference component;
discarding the direct current reference component;
adding a first new direct current reference component signal to said transient alternating current component during the signal time portions corresponding to said reference signals;
adding a second new direct current reference component signal to said transient alternating current component during the signal time portions corresponding to scene video;
whereby the overall dynamic range of the processed video signal from said adding of first and second new reference component signals is of limited amplitude.

4,963,964
APPARATUS FOR COMPUTING INTERPOLATION WEIGHTING FACTOR FOR TIME COMPRESSION OR EXPANSION

William T. Mayweather III, Lawrenceville, and Robert F. Nutter, Princeton, both of N.J., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed Jan. 30, 1990, Ser. No. 472,553
Int. Cl.[5] H04N *7/12*
U.S. Cl. 358—134 **6 Claims**



1. Apparatus for facilitating video signal time compression or time expansion, comprising:
a first storage device for storing a first value representing a desired time compression factor in a compression operating mode, and storing a second value representing a desired time expansion factor in an expansion operating mode;
a second storage device for storing a negative integer value in said time compression mode;
an accumulator;
means for selectively applying stored values from said first and second storage devices to said accumulator; and
means for deriving from said accumulator an auxiliary signal representing a fractional position of output pixel samples between input pixel samples.

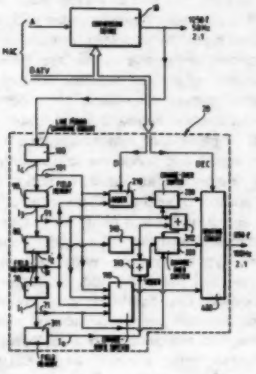
4,963,965
METHOD OF AND ARRANGEMENT FOR CONVERTING THE TEMPORAL RATE OF HIGH DEFINITION TELEVISION PICTURES AND TELEVISION PICTURE DECODER COMPRISING SUCH AN ARRANGEMENT

Mohammad-Réza Haghiri, Sceaux, and Philippe Guichard, Verrieres-le-Buisson, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 18, 1989, Ser. No. 423,173
Claims priority, application France, Oct. 21, 1988, 88 13809
Int. Cl.[5] H04N *7/01*
U.S. Cl. 358—140 **18 Claims**

1. A method of converting the temporal rate of high definition television pictures, comprising the following steps:
(a) dividing the line period of the sequence of original pictures by two;

(b) storing the consecutive field forming said pictures, for a working period corresponding to a period of the said pictures and at the rate corresponding to the temporal rate to be obtained after conversion;



(c) parallel processing of said stored fields by simple field repetition, by taking motion-compensated half-sums, and by filtering;

(d) selecting in dependence on additional information components, one of the three field sequences thus processed.

4,963,966

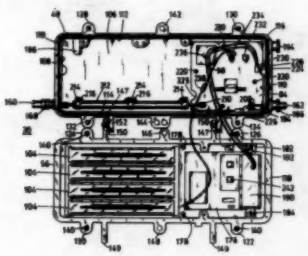
CATV DISTRIBUTION SYSTEM, ESPECIALLY ADAPTED FOR OFF-PREMISES PREMIUM CHANNEL INTERDICTION

Michael Harney, Atlanta; Mark Doremus, Lawrenceville; Steve Nussrallah, Alpharetta; Roy Lowcock, Lawrenceville, and Lamar West, Jr., Maysville, all of Ga., assignors to Scientific Atlanta, Inc., Atlanta, Ga.

Filed Dec. 4, 1989, Ser. No. 445,316

Int. Cl.[5] H04N *7/167*

U.S. Cl. 358—349 **55 Claims**



1. A CATV signal distribution system for distributing CATV signals to a plurality of premises where subscribers have subscribed for different levels of service and where potential subscribers are located, said system comprising a cable which traverses a path in proximity to said premises, means for propagating said CATV signal along said cable, said cable having a plurality of gaps adjacent different ones of said plurality of locations, a plurality means for tapping said signal from said cable located connected to said cable in different ones of said plurality of gaps, a plurality of housings each having a cover, said tapping means being disposed entirely in said cover, a plurality of different enclosure units which close said cover when attached thereto, means for controlling the signals distributed to subscribers in accordance with the levels of service to which they have subscribed contained in certain of said units; said certain units being attached to said cover to constitute certain of said housings, said tapping means being connected in CATV signal communication relationship with said controlling means in said certain housings, others of said units being plates which close said cover when attached thereto, said plates being attached to said covers to constitute others of said plurality of housings, means for electrically terminating said tapping means connection to said tapping means in the covers of said others of said plurality of housings, said certain of said plurality of housings being disposed along said cable in the proximity of the premises having the subscribers for different levels of service and said others of said plurality of housings being disposed along said cable in the proximity of the premises of the potential subscribers.

4,963,967

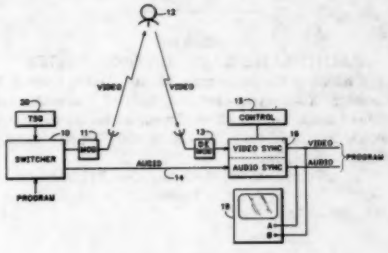
TIMING AUDIO AND VIDEO SIGNALS WITH COINCIDENTAL MARKERS

Steven Orland, Studio City, Calif., and Robert W. Parish, Gaston, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg. and National Broadcasting Company, Inc., Burbank, Calif.

Filed Mar. 10, 1989, Ser. No. 322,396

Int. Cl.[5] H04N *7/04, 5/04*

U.S. Cl. 358—143 **5 Claims**



1. A method of timing the audio and video components of a television signal that are transmitted from a transmitter to a receiver over different paths comprising the steps of:

periodically generating a distinctive video signal and an audio tone signal in time coincidence as coincidental markers for insertion into the respective components for transmission by the transmitter over the different paths;

displaying the audio and video components at the receiver as waveforms on a display device;

observing on the display device a time delay difference between the respective coincidental markers of the components; and

delaying one of the components at the receiver by an amount equal to the time delay difference so that the coincidental markers are in time coincidence.

4,963,968

METHOD AND APPARATUS FOR VALIDATING TELETEXT DATA

Richard E. F. Bugg, Coulsdon, and Nigel Metheringham, South Croydon, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1989, Ser. No. 356,042

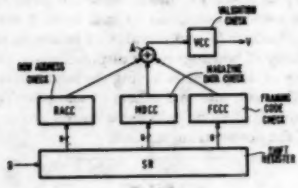
Claims priority, application United Kingdom, May 27, 1988, 8812592; Apr. 19, 1989, 8908801

Int. Cl.[5] H04N *7/087, 7/08*

U.S. Cl. 358—147 **10 Claims**

1. A teletext decoder for use in a receiver which is suitable for receiving teletext transmissions, said teletext decoder com-

prising means for receiving data pulses corresponding to a framing code and Hamming protected magazine and row (or packet) address data included in said transmissions, and validation means operable on said framing code and said Hamming protected magazine and row address data for affording an output indicative of the receipt of valid teletext data, characterised in that said validation means comprises an error check-



ing arrangement for monitoring the errors that may exist in each of the framing code, the magazine data and the row address data ard for affording an output indicative of valid teletext data being received if the combined total of errors does not exceed two and where, in the case of two errors, one is in the framing code whilst the other is in the Hamming protected data.

4,963,969

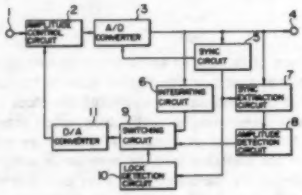
AUTOMATIC GAIN CONTROL DEVICE

Hiromu Kitaura, Osakasayama; Mitsuo Isobe, Osaka; Yuichi Ninomiya; Yoshimichi Ohtsuka, both of Kawasaki, and Yoshinori Izumi, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka and Nippon Hoso Kyokai, Tokyo, both of, Japan

Filed Feb. 23, 1989, Ser. No. 314,087

Int. Cl.[5] H04N *5/52*

U.S. Cl. 358—174 **5 Claims**



1. An automatic gain control device for amplitude control of an input television video signal of a type containing a positive polarity synchronizing signal having a vertical synchronizing signal which is formed of a frame pulse shaped in a 100% amplitude rectangular wave, said device comprising:

first amplitude detection means for detecting an average amplitude value and a peak amplitude value of the input television video signal and detecting a further amplitude value equal to that produced by mixing the detected average amplitude value and said peak amplitude value at a pre-determined ratio;

second amplitude detection means for detecting an amplitude value of one of said vertical synchronizing signal and a horizontal synchronizing signal from said input television video signal;

amplitude control means for controlling an amplitude of said input television video signal;

synchronization means, including a controllable oscillator, for detecting said vertical synchronizing signal and said horizontal synchronizing signal from said input television video signal in order to control an oscillation frequency of said oscillator, to generate at least one first-type pulse signal phase-lock synchronized with said input television video signal;

synchronization phase-lock detection means for detecting whether at least one said first-type pulse signal has been generated in phase-lock synchronism with said input television video signal by said synchronization means;

switching means, responsive to said synchronization phase-lock detection means, for enabling control of said amplitude control means responsive to a detection by said phase-lock detection means of a said first-type pulse signal generated in phase-lock synchronization with said input television signal and based on said amplitude value detected by said second amplitude detection means, and for enabling control of said amplitude control means responsive to a detection by said phase-lock detection means of at least one second-type pulse signal generated in non-phase-lock synchronization with said input television video signal and based on said further amplitude value detected by said first amplitude detection means; and

amplitude-hold means, responsive to said phase-lock detection means, for responding to a said second-type pulse signal generated after a said first-type pulse signal generated from said synchronization means respectively, in order to hold the amplitude value detected by said second amplitude detection means for a pre-determined time period after a detection by said phase-lock detection means of a second-type pulse signal from the synchronization means.

4,963,970

VERTICAL MOSFET DEVICE HAVING PROTECTOR

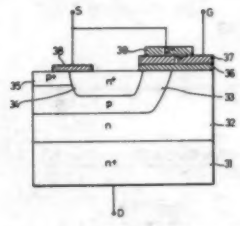
Kraisorn Throngnumchai, and Koichi Murakami, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

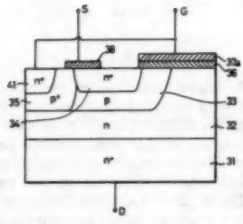
Filed Jan. 4, 1989, Ser. No. 267,886

Claims priority, application Japan, Nov. 6, 1987, 62-279099

Int. Cl.[5] H01 *29/78*

U.S. Cl. 357—23.4 **12 Claims**





1. A vertical MOSFET device, comprising:

a semiconductor layer of a first conductivity type;

a base region of a second conductivity type formed in a surface area of the semiconductor layer;

a source region of the first conductivity type formed in the base region;

a gate electrode formed at least on the base region and the semiconductor layer, via an insulating gate film interposed therebetween, to form a channel between the semiconductor layer and the source region, the gate electrode comprising a polycrystalline silicon film of the first conductivity type; and

a protector formed of a PN junction, the protector being formed between the source region and the gate electrode, the protector comprising the gate electrode, in contact with the insulating gate film, and a polycrystalline silicon film of the second conductivity type, the protector thermally contacting at least the base region and the semiconductor layer.

4,963,971

SYMMETRICAL POWER SEMICONDUCTOR DEVICE AND METHOD OF FABRICATION

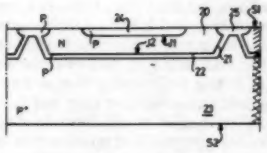
Pierre Rosetti, Fontenay Aux Roses, and Yvette Ribault, Montrouge, both of France, assignors to Telemecanique, France

Filed Dec. 7, 1989, Ser. No. 447,354

Claims priority, application France, Dec. 7, 1988, 88 106062

Int. Cl.[5] H01L *29/00, 29/74, 29/747, 29/04*

U.S. Cl. 357—37 **7 Claims**



1. A symmetrical power semiconductor device, comprising:

an N/P first layer defining a first main face;

a P/N second layer defining a second main face;

the second layer coming flush with the first face by means of grooves obtained by etching;

a P/N third layer formed between the first and second layers, including over the facettes of the grooves, and determining a junction with the first layer;

a P/N fourth layer diffused on the first face in the first layer; and

a P/N peripheral zone diffused on the first face so as to overlie the tips of the grooves and to form, together therewith, slabs for providing connections with the junction with the first face.

4,963,972

GATE TURN-OFF THYRISTOR WITH SWITCHING CONTROL FIELD EFFECT TRANSISTOR

Takashi Shinohe, Yokohama, and Akio Nakagawa, Hiratsuka, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 30, 1989, Ser. No. 302,952

Claims priority, application Japan, Jan. 30, 1988, 63-20304; Jun. 30, 1988, 63-160880

Int. Cl.[5] H01L *29/74*

U.S. Cl. 357—38 **17 Claims**

1. A gate turn-off thyristor comprising:

(a) a first emitter layer of a first type conductivity;

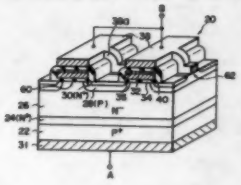
(b) a first base layer of a second type conductivity electrically connected to said first emitter layer and having a surface;

(c) a second base layer of the first type conductivity formed in the surface of said first base layer;

(d) a second emitter layer of the second type conductivity formed in said second base layer;

(e) a gate electrode provided to insulatively cover a portion of said second base layer which is positioned between said second emitter layer and said first base layer, said gate electrode having an elongated planar shape;

(f) a control electrode electrically connected to said second base layer, said control electrode comprising,



a first electrode portion insulatively provided above said gate electrode and having an elongated planar shape, and second electrode portion for electrically connecting said first electrode portion with said second base layer;

(g) an anode electrode formed to be electrically connected to said first emitter layer; and

(h) a cathode electrode formed to be electrically connected to said second emitter layer and to insulatively cover said control electrode.

4,963,973

SEMICONDUCTOR DEVICE

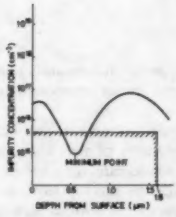
Atsuo Watanabe, Hitachiohta; Yoshiaki Yazawa, Hitachi; Atsushi Hiraishi, Hitachi; Masataka Minami, Hitachi; Takahiro Nagano, Hitachi; Takahide Ikeda, Tokorozawa, and Naohiro Momma, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 936,610, Dec. 1, 1986, abandoned. This application Mar. 13, 1989, Ser. No. 323,212

Claims priority, application Japan, Nov. 29, 1985, 60-267170

Int. Cl.[5] H01L *27/02*

U.S. Cl. 357—42 **3 Claims**



1. In a semiconductor device in which at least one well region is formed in a surface region of a semiconductor substrate, extending to the surface of the substrate, a semiconductor element is formed in the at least one well region, and the impurity concentration profile in the at least one well region has a shape, in the direction of increasing depth from the surface of the well region, of a valley, the improvement wherein said device includes a plurality of well regions in the semiconductor substrate, at least one of said plurality of well regions being of opposite conductivity type to that of the remainder of the plurality of well regions, with said plurality of well regions having said impurity concentration profile, and with a plurality of semiconductor elements being formed respectively in the well region of opposite conductivity type and in the remainder of the plurality of well regions; wherein said

plurality of semiconductor elements include at least one bipolar transistor and at least two MOSFETs, the MOSFETs being formed respectively in the at least one well region of opposite conductivity type and in at least one of the remainder of the plurality of well regions, whereby a CMOS structure is formed; wherein the concentration at a minimum point of said profile is greater than $5 \times 10^{14}cm-3$ but is smaller than $5 \times 10^{15}cm^{-3}$; and wherein the position of the minimum point is within 1.6 μm from the surface of the semiconductor substrate.

4,963,974

ELECTRONIC DEVICE PLATED WITH GOLD BY MEANS OF AN ELECTROLESS GOLD PLATING SOLUTION

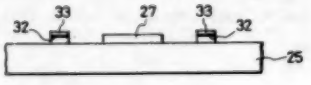
Jiro Ushio, Yokohama; Osamu Miyazawa, Yokosuka; Akira Tomizawa, Yokohama; Hitoshi Yokono, Ibaraki; Naoya Kanda; Naoko Matsuura, both of Yokohama; Setsuo Ando, Kawasaki, and Hiroaki Okudaira, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 143,959, Jan. 14, 1988, Pat. No. 4,880,464, which is a continuation-in-part of Ser. No. 918,498, Oct. 14, 1986, abandoned. This application Apr. 20, 1988, Ser. No. 184,061

Claims priority, application Japan, Oct. 14, 1985, 60-226738; Apr. 18, 1986, 61-88269

Int. Cl.[5] H01L *23/08, 23/52*

U.S. Cl. 357—80 **36 Claims**



33. An electronic device for mounting and interconnecting a plurality of integrated circuit semiconductor devices, comprising:

a ceramic substrate having top and bottom surfaces, provided with a plurality of pads for connecting to said integrated circuit semiconductor devices, and with engineering change pads, on the top surface, and provided with input/output pis on the bottom surface, said pads being in direct contact with the ceramic substrate and spaced from each other by a distance less than 200 μm, the pads comprising a first conductor layer on and in direct contact with said ceramic substrate, and coated with a second conductor layer,

a gold layer deposited electrolesaly on said second conductor layer from a plating solution that does not contain a cyanide compound, electrical insulation between said pads being maintained by means of avoiding deposition of said gold layer on the substrate in the space between pads, said plurality of integrated circuit semiconductor devices being mounted on said ceramic substrate, said integrated circuit semiconductor devices being connected electrically to said pads through said gold layer and a layer of solder on the gold layer, and

a sealing means for said integrated circuit semiconductor devices.

4,963,975

SEMICONDUCTOR DEVICE

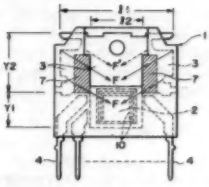
Hiromichi Sawaya, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 405,048, Sep. 11, 1989, abandoned, which is a continuation of Ser. No. 248,449, Sep. 23, 1988, abandoned. This application Jan. 22, 1990, Ser. No. 467,350

Claims priority, application Japan, Sep. 26, 1987, 62-241366

Int. Cl.[5] H01L *23/02*

U.S. Cl. 357—81 **12 Claims**



1. A semiconductor device comprising:

a semiconductor chip;

a heat radiation plate;

a lead member connected to said semiconductor chip; and

a mold member for sealing said semiconductor chip and part of said lead member in cooperation with said heat radiation plate;

wherein said heat radiation plate includes a main body having a central area, and a fixing member attached to said central area to fix said semiconductor device to an external member, said main body further including a mounting portion projecting horizontally from said central area for mounting said semiconductor chip and first and second cutout portions located on the same side of said main body as said mounting portion and positioned on opposite sides of said central area of said main body for interrupting mechanical stresses formed in the semiconductor device by said fixing member.

4,963,976

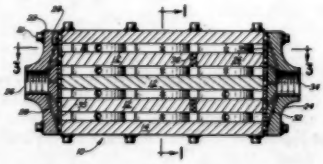
INTEGRATED ELECTRICAL CONDUCTING, COOLING AND CLAMPING ASSEMBLY FOR POWER SEMICONDUCTORS

Theodore D. Fluegel, Rockford, and Bryan W. Dishner, Roscoe, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 12, 1988, Ser. No. 243,511

Int. Cl.[5] H01L *25/04*

U.S. Cl. 357—82 **11 Claims**



1. A multiple phase electronic semiconductor package comprising;

a stack of electrically conductive plates, including two opposite end plates, at least one interposed semiconductor component and two side plates flanking said stack;

the height of said side plates being less than the height of said conductive plates and semiconductor components; and

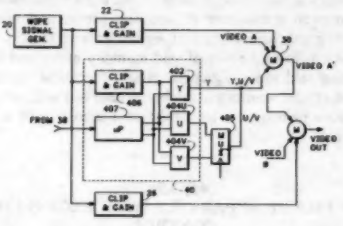
a means to secure said opposite end plates to said side plates causing a pre-determined amount of pressure between said conductive plates and semiconductor components.

4,963,977

APPARATUS FOR GENERATING A VIDEO SIGNAL REPRESENTING A FIELD OF SPATIALLY VARYING COLOR

Richard A. Jackson, and John Abt, both of Nevada City, Calif., assignors to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Dec. 21, 1988, Ser. No. 287,360
Int. Cl.[5] H04N 9/74
U.S. Cl. 358—22 **4 Claims**



1. A matte generator comprising:

memory means, having a plurality of separately addressable storage locations, for storing respective sets of coefficients representative of a plurality of colors respectively, and

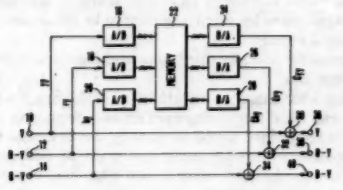
addressing means for addressing the memory means, said addressing means comprising input means for receiving an initial address word that defines the location of a first set of the coefficients, means for providing a control signal, and means for additively combining the initial address word with the control signal to provide an address signal and for applying the address signal to the memory means.

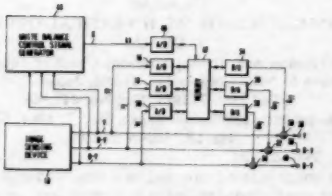
4,963,978

COLOR CORRECTION CIRCUIT

Osamu Ueda, and Teruo Hieda, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 31, 1989, Ser. No. 387,716
Claims priority, application Japan, Aug. 8, 1988, 63-196027
Int. Cl.[5] H04N 9/73
U.S. Cl. 358—29 **14 Claims**





1. A color correction apparatus comprising:

(a) A/D conversion means for performing A/D conversion of each of a luminance signal and color-difference signals included in an input signal;

(b) a memory having stored color correction data in addresses corresponding to outputs of said A/D conversion means; and

(c) calculating means for performing calculation on outputs of said memory as well as the luminance signal and the color-difference signals.

8. A color image sensing apparatus comprising:

(a) image sensing means for sensing an image of an object;

(b) a memory having stored color correction data corresponding to a predetermined color signal included in an output of said image sensing means and a color temperature of the object; and

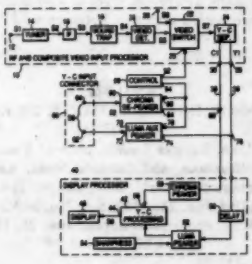
(c) correction means for correcting an output of said image sensing means by using an output of said memory.

4,963,979

TELEVISION RECEIVER WITH AUXILIARY INPUT CONNECTOR FOR VIDEO SIGNALS OF A SEPARATED Y-C FORMAT

Gene K. Sendelweck, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Apr. 20, 1989, Ser. No. 340,942
Int. Cl.[5] H04N 5/445
U.S. Cl. 358—37 **8 Claims**



1. Television apparatus, comprising:

a display processing section including a chrominance peaking filter, a luminance peaking filter, a processing unit having inputs coupled to receive luminance and chrominance output signals from said filters and having an output coupled to supply a processed signal to a display device;

a video signal source having first and second outputs coupled via first and second circuit paths to supply first luminance and first chrominance input signals to respective inputs of said peaking filters;

an auxiliary input connector having first and second terminals for separately providing a second luminance input signal and a second chrominance input signal;

third and fourth circuit paths for coupling said second luminance input signal and said second chrominance input signal to respective inputs of said peaking filters;

a first video signal amplitude modifier connected to said luminance peaking filter for modifying a parameter of said second luminance input signal supplied to said display processing section via said third path; and

a second video signal amplitude modifier connected to said chrominance peaking filter for modifying a parameter of said second chrominance input signal supplied to said display processing section via said fourth path.

4,963,980

IMAGE SENSING DEVICE

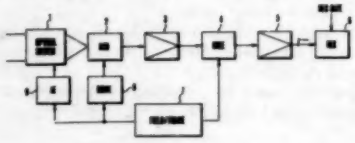
Akira Suga, and Kan Takaiwa, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 151,573, Feb. 2, 1988, abandoned. This application Dec. 13, 1989, Ser. No. 453,213

Claims priority, application Japan, Feb. 6, 1987, 62-24624; Feb. 6, 1987, 62-24625

Int. Cl.[5] H04N *5/335*

U.S. Cl. 358—209 8 Claims



1. An image sensing device comprising:

(a) image sensing means having photo-electric converting cells arranged in a plurality of rows and columns to generate electrical signals in accordance with light incident thereon;

(b) reading means for reading the electrical signals of each of said rows one by one in a first mode and electrical signals of a plurality of rows by adding them together in a second mode, said reading mans being arranged to permit a selection between said first and second modes; and

(c) control means having non-linear converting means for non-linearly converting said electrical signals and for controlling the saturation level of said electrical signals in accordance with a selection between said first and second modes.

4,963,981

IMAGE SENSOR DEVICE CAPABLE OF ELECTRONIC ZOOMING

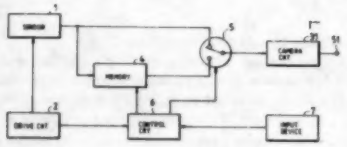
Yoshihiro Todaka; Takuya Imaide, both of Yokohama; Toshiro Kinugasa, Hiratsuka, and Masaru Noda, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

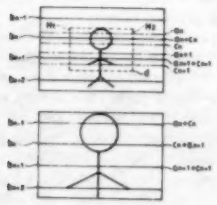
Filed Jun. 21, 1989, Ser. No. 369,342

Claims priority, application Japan, Jun. 21, 1988, 63-151319

Int. Cl.[5] H04N *3/14*

U.S. Cl. 358—213.13 6 Claims





1. An integer comprising:

a sensor array of N rows and M columns of photoelectric transducers each capable of generating an electrical signal in response to a light intensity applied thereto;

a signal processor coupled to said sensor array for generating a video signal from electrical signals from transducers in a pair of adjacent rows in said sensor array, including a memory array of n rows and m columns of storage locations which corresponds to a sub-array, whose area is to be zoomed, of n rows and m columns in said sensor array of N rows and M columns, each storage location in said memory array being capable of storing an electrical signal from each transducer in said sub array, and means for reading out said electrical signals stored at said storage locations in said rows of said memory array and for producing said video signal from said electrical signals, said rows of said memory array being read out with a shift row by row in response to a shift of a scan line of a display picture.

4,963,982

IMAGE PICKUP APPARATUS WITH EXCESS-CHARGE CONTROL

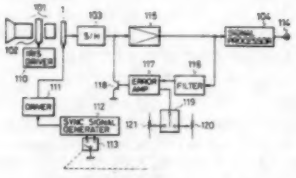
Teruo Hieda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 165,098, Mar. 7, 1988, abandoned, which is a division of Ser. No. 809,915, Dec. 17, 1985, Pat. No. 4,748,506. This application Oct. 3, 1989, Ser. No. 418,737

Claims priority, application Japan, Dec. 28, 1984, 59-276972; Dec. 28, 1984, 59-276973; Dec. 28, 1984, 59-276974

Int. Cl.[5] H04N *3/14*

U.S. Cl. 358—213.18 20 Claims



1. An image pickup apparatus comprising:

(a) image pickup means for converting an image into an electrical signal and for accumulating the electrical signal;

(b) means for shortening an accumulating time of said image pickup means by supplying thereto an accumulating time control signal;

(c) means for visually displaying said electrical signal as an image; and

(d) means for changing a plurality of edge lines of a frame of the electrical signal displayed by said displaying means to a predetermined signal other than the electrical signal in response to the shortening operation of said shortening means, to eliminate noise in said edge lines caused by the shortening operation.

4,963,983

CCD IMAGE SENSOR WITH VERTICAL OVERFLOW DRAIN

Akiyoshi Kohno, and Atsushi Mikoshiba, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 7, 1989, Ser. No. 447,468

Claims priority, application Japan, Dec. 7, 1988, 63-310381

Int. Cl.[5] H04N *5/228*

U.S. Cl. 358—213.31 7 Claims

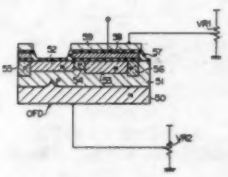
1. An image sensor fabricated on a semiconductor substrate of a first conductivity type and having at least an electronic shutter mode and a charge transferring mode of operation, comprising:

(a) a plurality of photo sensing elements arranged in rows and columns and operative to accumulate effectual elec-

tric charges in said electronic shutter mode of operation and ineffectual electric charges out of the electronic shutter mode of operation in the presence of optical images, said photo sensing elements being respectively formed by a plurality of impurity regions of said first conductivity type defined in a well of a second conductivity type provided in said semiconductor substrate, said second conductivity type being opposite to said first conductivity type;

(b) a plurality of vertical shift registers coupled to the columns of said photo sensing elements, respectively, and operative to receive said effectual electric charges from said photo sensing elements in the presence of a read out signal produced in a vertical blanking time period and to transfer said effectual electric charges in response to a multi-phase vertical transferring signal in said charge transferring mode of operation, said vertical shift registors being formed in said well;

(c) a horizontal shift registor coupled to said vertical shift registors for transferring said effectual electric charges fed from said vertical shift registors in response to a multiple-phase horizontal transferring signal; and



(d) a conductive photo shield plate provided over said well and having an opening exposing said photo sensing elements to said optical images, in which said image sensor is provided in association with a biasing voltage controlling unit responsive to a vertical driving signal and a horizontal driving signal and operative to produce a first biasing voltage signal fed to said photo shield plate and a second biasing voltage signal fed to said semiconductor substrate, said first biasing voltage signal shifting its voltage level from a first level to a second level at a first time and from the second level to the first level at a second time, said second biasing voltage signal momentarily shifting its voltage level between a third level and a fourth level at a third time so as to allow a punch-through phenomenon to take place between said semiconductor substrate and said photo sensing elements for discharging said ineffectual electric charges into the semiconductor substrate, said image sensor entering into said electronic shutter mode of operation from said third time to said second time, and in which said first level restricts the production of ineffectual electric charges but said second level promotes the production of said effectual electric charges.

4,963,984

OPTICAL PROJECTION CAMERA ALIGNMENT SYSTEM AND METHOD

Kenneth H. Womack, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 10, 1989, Ser. No. 349,744

Int. Cl.[5] H04N *5/225*

U.S. Cl. 358—225 **6 Claims**

1. An optical projection camera alignment apparatus comprising:

a camera body;

an image sensor mounted in said camera body and having a pattern thereon;

a lens means coupled to said camera body for focusing onto an object plane; and

means for directing light onto said image sensor to project the image sensor pattern through said lens means onto the

object plane to facilitate alignment of the camera with respect to the object plane.

4,963,985

VIDEO CAMERA USING INTERPOLATING FOCUS CONTROL

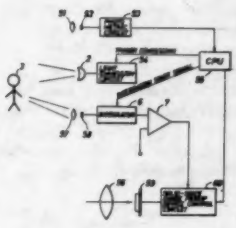
Seiichi Isoguchi; Yoshio Mural; Jun Takayama, and Katsuya Nagaishi, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 281,080, Dec. 8, 1988, abandoned, which is a division of Ser. No. 159,933, Feb. 24, 1988, abandoned. This application Jan. 19, 1990, Ser. No. 465,598

Claims priority, application Japan, Feb. 25, 1987, 62-44028; Mar. 6, 1987, 62-51488; Mar. 6, 1987, 62-51489; Apr. 20, 1987, 62-97914; Apr. 24, 1987, 62-101533; May 13, 1987, 62-117637; May 13, 1987, 62-117638; May 13, 1987, 62-117639

Int. Cl.[5] H04N *5/38, 3/26*

U.S. Cl. 358—227 **4 Claims**



1. A focusing apparatus for a still video camera for taking a still video image, the apparatus comprising:

image pickup means for generating an image signal in response to light incident thereon;

lens means for forming an image on the image pickup means, said lens means being capable of moving from a position of a closest focusing distance to a position of an infinite focusing distance;

integrating means for integrating a plurality of high frequency components of the image signal at respective ones of a plurality of steps as the lens means moves between the position of closest focusing distance to the position of infinite focusing distance prior to taking a still video image; and

determining means for determining the in-focus position of the lens means on the basis of the integrated values of the high-frequency components of the image signal by interpolating from the integrated values of the high-frequency components of the image signal at the plurality of steps of the lens means to determine a maximum value, the maxi-

mum value of the high frequency component of the image signal corresponding to the in-focus position of the lens means, said lens means being moved to said in-focus position.

4,963,986

IMAGE INPUT APPARATUS FOR RESETTING THE AMOUNT OF EXPOSURE FROM A CORRECTION VALUE FOR A PREDETERMINED STANDARD VALUE

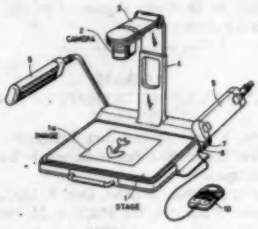
Shigeru Fukuyama, and Tadashi Okino, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1988, Ser. No. 230,998

Claims priority, application Japan, Aug. 12, 1987, 62-199877

Int. Cl.[5] H04N *5/238*

U.S. Cl. 358—228 **17 Claims**



1. An image input apparatus comprising:

a lens unit;

photoelectric conversion means arranged to be exposed to optical images from the lens unit;

automatic exposure means for controlling an amount of exposure of said photoelectric conversion means so that the amount of exposure becomes a predetermined standard value;

correction means for adjusting said automatic exposure means to modify said standard value to a correction value; and

reset means for converting said correction value to the predetermined standard value.

4,963,987

VIDEO CAMERA APPARATUS WITH GRIP AXIS AND VIEWFINDER OPTICAL AXIS IN PARALLEL RELATION

Hiroyuki Ichiyoshi, Kanagawa, and Kazunori Kashimura, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1988, Ser. No. 266,950

Claims priority, application Japan, Nov. 6, 1987, 62-279331

Int. Cl.[5] H04N *5/30*

U.S. Cl. 358—229 **17 Claims**

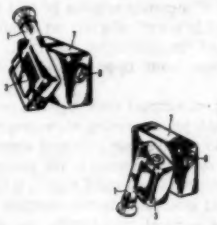
1. A video camera apparatus comprising:

a viewfinder;

a camera grip integrally interlinked with said viewfinder; and

installing means for installing said camera grip on a camera body such as to be rotatable,

wherein said installing means is arranged to be capable of retaining said camera grip at a desired position within a rotating range with respect to said camera body, a positional relationship between said camera grip and said viewfinder being such that a longitudinal axis of a part of



said camera grip held by an operator's hand is substantially parallel with an optical axis of said viewfinder.

4,963,988

FACSIMILE DEVICE

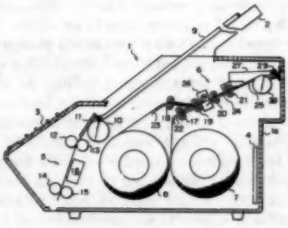
Keizo Baba, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 313,452

Claims priority, application Japan, Feb. 22, 1988, 63-040260

Int. Cl.[5] H04N *1/00*; G01D *15/28*

U.S. Cl. 358—296 **19 Claims**



1. A facsimile device with two or more sets of recording medium, comprising:

control means for controlling said facsimile device so as to change over a first set of recording medium to a second set of recording medium when an abnormal state such as a shortage of recording medium is detected;

memory means for storing therein image information during a time period of changing over said first set of recording medium to said second set of recording medium when said image information is communicated to the facsimile device from an other; and

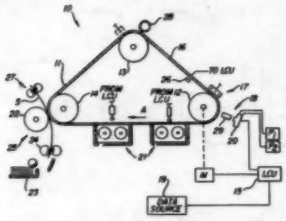
recording means for recording said image information on said first set of recording medium, temporarily suspending the operation of recording when an abnormal state such as a shortage of recording medium is detected, storing said image information in said memory means at the same time, reading out in order said image information from said memory means after finishing the change-over, and recording said image information on said second set of recording medium.

4,963,989

METHOD AND APPARATUS FOR GREY LEVEL PRINTING

Roger A. Morton, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 18, 1989, Ser. No. 453,422
Int. Cl.[5] H04N 1/29; G01D 15/14
U.S. Cl. 358—298 22 Claims



1. A non-impact printer apparatus comprising:

a plurality of recording elements;

serial-in, parallel-out shift register means for storing signals in the form of digital data bits for activating the recording elements,

driver means for activating a recording element in response to a signal representing a predetermined type of digital data bit;

processing means for processing data for input to said serial register means; said processing means including

memory means for storing a plurality of multibit grey level data signals, each multibit signal representing a pulse width duration period for activating a respective one of said recording elements;

counter means for generating a multibit count signal that represents a time-changing count;

decision means responsive to a multibit grey level signal from said memory means and to said multibit count signal and for selectively outputting a signal representing a single digital data bit to the input of said serial-register, said single digital data bit being in accordance with a predetermined program that shifts the commencement on-times for activating recording elements so that some recording elements to be activated for different pulsewidth durations commence activation at different times.

4,963,990

CONTINUOUS HALFTONING USING QUARTERNARY PIXEL CELLS

Thomas A. Henderson, Rochester, and John F. Knapp, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

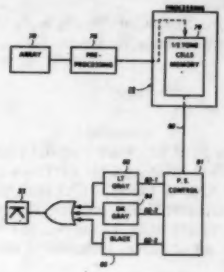
Filed Jun. 9, 1989, Ser. No. 363,838
Int. Cl.[5] H04N 1/23
U.S. Cl. 358—298 14 Claims

1. A method of obtaining continuous tone reproductions of a raster scanned digital image having a given number of pixels for each halftone cell of the digital image using four output scanner modulating tone levels for each pixel including a black and a white level comprising the steps of:

choosing two reflectance gray pixel levels intermediate to the black and white levels to combine with the black and white pixel levels for providing quadruplets, four numbers specifying the total number of pixels in each halftone cell, corresponding to each of the four tone levels, for modulating the output scanner.

determining a total number of average halftone cell gray levels to be available for the digital image;

creating a list of quadruplets that describe all possible average halftone cell grey levels available with the four modulating tone levels, and



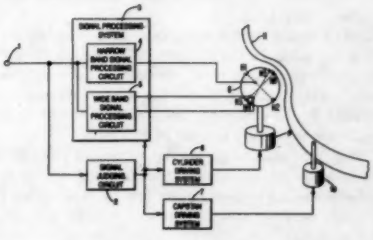
selecting a set of quadruplets from said list equal to a desired number of all gray levels, and set of quadruplets selected to maximize the occurrence of black and white pixel levels in each halftone cell.

4,963,991

VIDEO TAPE RECORDER CAPABLE OF RECORDING BOTH NARROWBAND AND WIDEBAND SIGNALS

Masahiro Honjo, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 25, 1989, Ser. No. 303,743
Claims priority, application Japan, Jan. 25, 1988, 63-13870
Int. Cl.[5] H04N 5/782
U.S. Cl. 358—310 8 Claims



1. A video tape recorder comprising:

a cylinder on which a plurality of heads are mounted;

a capstan for transporting a tape;

a signal detecting means for detecting whether an input signal is a first signal or a second signal, said second signal having a wider frequency band than that of said first signal;

a signal processing means responsive to an output of said signal detecting means for recording said first signal on said tape by n heads selected from among said plurality of heads after processing the said input signal by a first processing method when the input signal is said first signal, and for recording said second signal on said tape by m heads selected from among said plurality of heads after processing the input signal by a second processing method containing a means for expansion and compression of the time axis of said second signal when the input signal is said second signal, where n is an integer equal to the number of heads used for recording said first signal and m is an integer equal to the number of heads used for recording said second signal and m is larger than n;

a capstan driving means responsive to said output of said signal detecting means for driving said capstan so as to transport said tape at a first running speed when the input

signal is said first signal and so as to transport said tape at a second running speed which is equal to or faster than said first running speed when the input signal is said second signal; and

a cylinder driving means for driving said cylinder so as to rotate at an almost constant speed.

4,963,992

APPARATUS FOR RECORDING/REPRODUCING DIGITAL VIDEO SIGNALS IN BOTH A STANDARD MODE AND A LONG PLAYING MODE

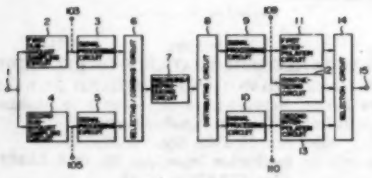
Nobukazu Doi, Hachioji; Yoshizumi Eto, Sagamihara; Morishi Izumita, Inagi; Seiichi Mita, Kanagawa, and Kazuyuki Takeshita, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 26, 1989, Ser. No. 301,462

Claims priority, application Japan, Jan. 29, 1988, 63-17224

Int. Cl.[5] H04N *5/76, 5/92*

U.S. Cl. 358—335 **4 Claims**



1. An apparatus for recording and reproducing a digital video signal, comprising:

n sampling means each for performing a sub-Nyquist sampling operation for the digital video signal in such a manner that every n-th pixel sampled by the sub-Nyquist sampling operation of one of the n sampling means is not sampled by the remaining ones of the n sampling means, where n is a positive integer of at least 2;

recording/reproducing means for recording and reproducing information including pixels sampled by the n sampling means in a standard mode and by m sampling means in a long playing mode, where m is a positive integer less than n; and

means for reconstructing the digital video signal from the reproduced information in the standard mode and from the reproduced information by interpolating pixels not samples by the m sampling means in the long playing mode.

4,963,993

VIDEO RECORDER WITH INCREASED BANDWIDTH RECORDING

Hans-Jürgen Kluth, VS-Villingen, Fed. Rep. of Germany, assignor to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Sep. 29, 1988, Ser. No. 250,552

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1987, 3732734

Int. Cl.[5] H04N *9/80*

U.S. Cl. 358—330 **21 Claims**

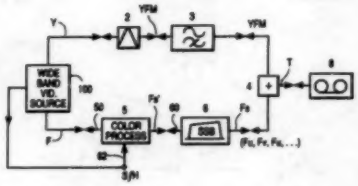
1. Apparatus, comprising:

a source of a luminance containing signal;

means for frequency modulating said luminance containing signal with an FM carrier to generate a frequency modulated signal having a first frequency spectrum in a first frequency band;

a source of a chrominance containing signal;

means including a modulator for single sideband modulating said chrominance containing signal with a second carrier to generate a second modulated signal having a second frequency spectrum in the form of a single sideband to one side of said second carrier that is located in a second



frequency band below said first frequency band in a region that is generally empty of frequencies belonging to said frequency modulated signal; and

means for recording said frequency and second modulated signals of a magnetic tape.

4,963,994

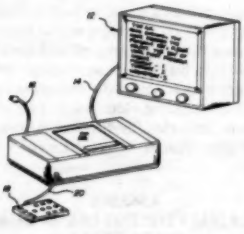
VCR PROGRAMMER

Michael R. Levine, 2900 Heatherway, Ann Arbor, Mich. 48104

Continuation of Ser. No. 213,162, Jun. 29, 1988, Pat. No. 4,908,713, which is a continuation of Ser. No. 634,179, Jul. 24, 1984, abandoned, which is a continuation of Ser. No. 330,111, Dec. 14, 1981, abandoned. This application Feb. 23, 1990, Ser. No. 484,175

Int. Cl.[5] H04N *5/782*

U.S. Cl. 358—335 **7 Claims**



1. A video recorder interactive control system for connection to a source of television signals and to a television display, the system comprising:

a video recorder system housing;

an electronically adjustable television channel tuner disposed in said video recorder system housing and connected to the source of television signals;

a video record/playback means disposed in said video recorder system housing and having a input connected to said television channel tuner and having an output, said video record/playback means operating in a record mode for recording the television signal tuned by said television channel tuner and in a playback mode for reproducing a previously recorded video signal on said output;

a character generator disposed in said video recorder system housing and having an input for receiving digital signals representative of alphanumeric characters, said character

generator being operative to convert said digital signals into video signals;

an interface means disposed in said video recorder system housing and connected to the television display, to said video record/playback means and to said character generator for displaying either said output signal from said video record/playback means or said video signal from said character generator via the television display;

a clock means disposed in said video recorder system housing for generating a real time clock signal indicative of the current time;

a message memory disposed in said video recorder system housing and having stored therein a plurality of digital signals representative of a plurality of alphanumeric prompting messages for an operator;

a record program memory disposed in said video recorder system housing and being operative to store the channel and the time of occurrence of at least one future program that is to be recorded;

a first operator controlled input means disposed remotely from said video recorder system housing for entering a plurality of control inputs for said video recorder interactive control system including the channel and start time of future programs that are to be recorded in said record program memory and set signals for said real time clock;

second operator controlled input means disposed on said video recorder system housing not including means for entering the channel and start time of future programs to be recorded or set signals for said real time clock; and

a control means disposed in said video recorder system housing and connected to said television channel tuner, said video record/playback means, said character generator, said interface means, said clock means, said message memory, said record program memory and said first and second input means, said control means being operative to

supply a channel input to said television channel tuner in accordance with control inputs from said first or second input means,

place said video record/playback means in either record mode or playback mode in response to control inputs from said first or second input means,

recall digital signals representative of appropriate prompting messages form said message memory,

supply said digital signals to said character generator,

select said video signal from said character generator at said interface means for display via the television display,

store the channel and start time of future programs that are to be recorded in said record program memory in accordance with an interactive program adapted to receive control inputs from said first input means, said interactive program being operative to adaptively select said prompting messages according to the previous control inputs from said input means,

compare said real time clock signal with the time for the next instance of a desired future recording program stored in said record program memory,

supply said channel stored in said record program memory to said television channel tuner; and

place said video record/playback means in record mode when said real time signal is included within a time stored in said record program memory for the recording of a program;

whereby said first operator controlled input means disposed remotely from said video recorder system housing replaces substantially all controls for entering the channel and start time of future programs that are to be recorded and set signals for said real time clock, which controls would otherwise be disposed on said video recorder system housing.

4,963,995

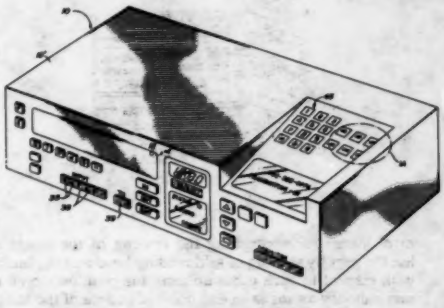
AUDIO/VIDEO TRANSCEIVER APPARATUS INCLUDING COMPRESSION MEANS

Richard A. Lang, Cave Creek, Ariz., assignor to Explore Technology, Inc., Scottsdale, Ariz.

Filed Dec. 27, 1988, Ser. No. 289,776

Int. Cl.[5] H04N 5/76

U.S. Cl. 358—335 **80 Claims**



1. An audio/video transceiver apparatus comprising:

input means for receiving audio/visual source information;

compression means, coupled to said input means, for compressing said audio/video source information into a time compressed representation thereof having an associated time period that is shorter than a time period associated with a real time representation of said audio/video source information;

random access storage means, coupled to said compression means, for storing the time compressed representation of said audio/video source information; and

output means, coupled to said random access storage means, for receiving the time compressed audio/video source information stored in said random access storage means for transmission away from said audio/video transceiver apparatus.

4,963,996

IMAGE READER/EDITOR WITH OPERATOR INTERACTION

Yuichi Bannai, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 30,293, Mar. 23, 1987, Pat. No. 4,761,818, which is a continuation of Ser. No. 596,833, Apr. 4, 1984, abandoned. This application Dec. 23, 1987, Ser. No. 138,442

Claims priority, application Japan, Apr. 8, 1983, 58-60951; Apr. 8, 1983, 58-60953; Jun. 20, 1983, 58-109426; Jun. 20, 1983, 58-109427

Int. Cl.[5] G06K 9/20

U.S. Cl. 358—453 **5 Claims**

1. An image reading apparatus comprising:

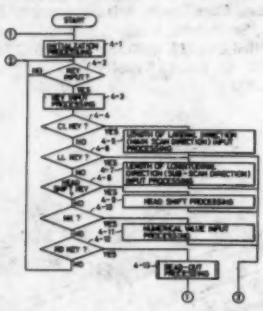
a reading head for reading an image;

first instruction means for instructing relative movement of said reading head and the image in a predetermined direction to a desired position of said reading head with respect to the image in response to the input of instructions from an operator;

shifting means for shifting said reading head and the image with respect to each other in the direction instructed by said first instruction means to the desired position of said reading head with respect to the image without reading the image;

second instruction means for, after said reading head and the image are shifted with respect to each other and said reading head is positioned at the desired position with respect to the image without reading the image, instructing the desired position to be stored;

memory means for storing the position of said reading head with respect to the image instructed to be stored by said second instruction means; and



control means for controlling the reading of the image at least in part by shifting of said reading head and the image with respect to each other utilizing the position stored in said memory means as an end point of an area of the image to be read by said reading head.

4,963,997

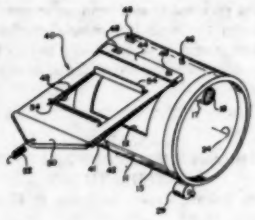
FILM MOUNTING MECHANISM FOR IMAGE SCANNER APPARATUS OF THE DRUM TYPE

Paul E. VanScooter, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 30, 1989, Ser. No. 358,212

Int. Cl.[5] H04N *1/04*

U.S. Cl. 358—493 **10 Claims**



1. In image scanner apparatus of the drum type, wherein the improvement comprises a mechanism for mounting a flexible image-bearing film immediately adjacent said drum, in a curved plane substantially parallel with the curved surface of said drum and in registration with an aperture on said curved surface of said drum such that the film image to be scanned is free of drum support.

4,963,998

APPARATUS FOR MARKING A RECORDED SIGNAL

Barry G. Maufe, London, England, assignor to Thorn EM plc, London, England

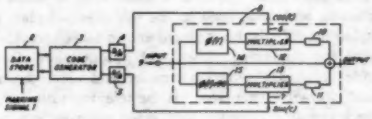
Filed Apr. 20, 1989, Ser. No. 341,943

Claims priority, application United Kingdom, Apr. 20, 1988, 8809347

Int. Cl.[5] G11B *15/04*

U.S. Cl. 360—60 **3 Claims**

1. Apparatus for marking a recorded signal, said apparatus including: means for generating and storing a marking signal comprising at least two codes which are mutually in phase quadrature; means for converting said codes from a digital to an analogue signal; and modulating means including phase shift means such that the two marking codes can be used to phase-shift modulate the signal to be recorded, said modulating



means performing the function of a single side band modulator on the said signal to be recorded.

4,963,999

TAPE POSITION DETECTION APPARATUS HAVING START CONTROL AND INITIAL TAPE POSITION RECOVERY

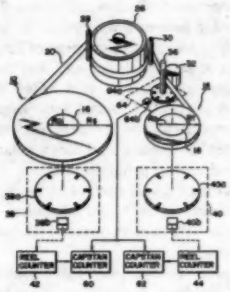
Masaaki Utsunomiya, Yokohama, and Fumio Izawa, Sagamihara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 22, 1988, Ser. No. 158,684

Claims priority, application Japan, Feb. 23, 1987, 62-39588

Int. Cl.[5] G11B *27/10, 27/34, 15/18*

U.S. Cl. 360—72.3 **21 Claims**



1. A tape position detection apparatus having start control function, comprising:

tape drive means for feeding a tape wound on reels in a first direction for forward or reverse feed;

tape-returning means for feeding said tape in a second direction opposite to said first direction, such that said tape is returned to its initial position prior to said tape being fed in said first direction;

detecting means, operatively coupled to said reels and said tape, for detecting data representing the amount said tape was fed in said first direction, the amount said tape was fed in said second direction, and the amount of rotation of said reels;

start command generating means for outputting a start command to start an operation of detecting the position of said tape on the reels;

controlling means, receiving said start command from said start command generating means, for controlling said tape drive means and said tape-returning means, the controlling means controlling said tape drive means after said start command is received such that said tape is driven in said first direction for a predetermined period of time, the controlling means automatically causing said tape-returning means to return said tape to said initial position after said tape drive means moved said tape from said initial position for said predetermined period of time;

calculating means for calculating the used or residual amount of said tape utilizing said data detected by said detecting means; and

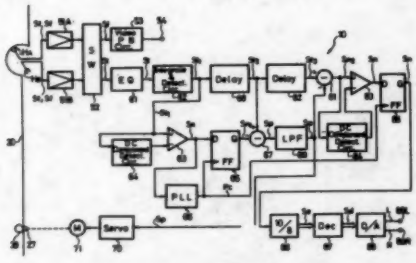
display means for displaying the used or residual amount of the tape calculated by said calculating means.

4,964,000

CIRCUIT FOR SEPARATING SIMULTANEOUSLY REPRODUCED PCM AND ATF SIGNALS HAVING AT LEAST PARTIALLY OVERLAPPING FREQUENCY BANDS

Keiji Kanota, Kanagawa, and Noboru Murabayashi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 23, 1988, Ser. No. 275,413
Claims priority, application Japan, Nov. 26, 1987, 62-298833
Int. Cl.[5] G11B *5/584, 5/09, 20/10*
U.S. Cl. 360—77.14 16 Claims



1. In an apparatus for reproducing an addition signal recorded in a track on a recording medium and which is the result of the addition of a pilot signal to a digital signal modulated by an information signal, with said digital signal and said pilot signal occupying frequency bands that overlap, at least in part, the combination of:

reproducing head means for reproducing said addition signal from said track;

means for detecting a D.C. component of the reproduced addition signal;

voltage comparing means for comparing the level of the reproduced addition signal in respect to the detected D.C. component thereof and extracting said digital signal as an output therefrom; and

subtracting means for subtracting said output of said voltage comparing means from said reproduced addition signal and thereby providing said pilot signal as an output from said subtracting means.

4,964,001

MAGNETIC RECORDING/REPRODUCING APPARATUS FOR SELECTIVE USE WITH TAPE CASSETTES OF TWO DIFFERENT SIZES

Hiromichi Hirayama, Yokohama; Masato Mihara, Hiratsuka, and Mitsuo Harumatsu, Ota, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 11, 1989, Ser. No. 392,858
Claims priority, application Japan, Aug. 11, 1988, 63-200702; Aug. 11, 1988, 63-200703; Aug. 23, 1988, 63-110154[U]
Int. Cl.[5] G11B *15/675, 5/008*
U.S. Cl. 360—94 12 Claims

1. A compatible recording/reproducing apparatus for selective use with a relatively large-size tape cassette and a relatively small-size tape cassette, the small-size tape cassette having a driven gear, the apparatus comprising:

(a) a main chassis having a principal plane;

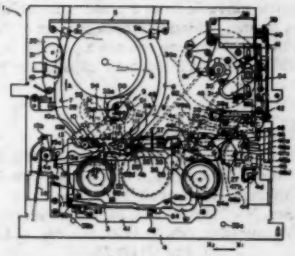
(b) first positioning means fixedly mounted on the main chassis for positioning the large-size tape cassette thereon;

(c) a first and a second drive spindle on the main chassis for driving engagement with the large-size tape cassette positioned on the first positioning means;

(d) a floating chassis mounted to the main chassis for displacement in a direction at right angles with the principal plane of the main chassis;

(e) second positioning means fixedly mounted on the floating chassis for positioning the small-size tape cassette thereon, which is smaller than the large-size tape cassette;

(f) a drive gear rotatably mounted in a preassigned position on the floating chassis for driving engagement with the driven gear of the small-size tape cassette positioned on the second positioning means, the first drive spindle also making driving engagement with the small-size tape cassette positioned on the second positioning means; and



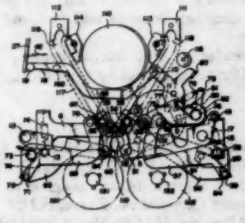
(g) floating-chassis drive means for moving the floating chassis relative to the main chassis between a working position, where the floating chassis has the small-size tape cassette positioned on the second positioning means thereon, with the driven gear of the small-size tape cassette in engagement with the drive gear on the floating chassis, and a retracted position where the second positioning means and the drive gear on the floating chassis are out of interference with the large-size tape cassette positioned on the first positioning means on the main chassis.

4,964,002

MAGNETIC RECORDING AND REPRODUCING APPARATUS HAVING A PAIR OF SKEW GUIDE BLOCKS

Niro Nakamichi, South Laguna, Calif., assignor to Nakamichi Corporation, Kodaira, Japan

Filed Nov. 25, 1988, Ser. No. 275,965
Claims priority, application Japan, Nov. 27, 1987, 62-299534
Int. Cl.[5] G11B *5/008*
U.S. Cl. 360—95 3 Claims



1. A magnetic recording and reproducing apparatus having a pair of reel shafts rotatable about respective reel axes, for recording signals on and reproducing signals from a magnetic tape in a tape cassette, comprising:

a rotatable drum inclined at an angle to a reference plane perpendicular to the reel axes and having transducer heads for recording signals on and reproducing signals from the magnetic tape;

a pair of skew blocks fixedly disposed laterally of said rotatable drum for guiding said magnetic tape at a magnetic layer surface thereof, having on its front face, first and second straight guide projections, each forming an inclined angle with respect to said reference plane and forming an angle between each other;

a pair of vertical guide rollers movable from a first position in which said vertical guide rollers are located in an opening in the tape cassette behind a back surface of said magnetic tape opposite to said magnetic layer surface toward a second position in which said vertical guide rollers are located adjacent said skew blocks, respectively, for withdrawing the magnetic tape from the tape cassette and holding said magnetic layer surface of the magnetic tape against said rotatable drum and said skew blocks; and

a pinch roller movable from a position in which the pinch roller is located behind said back surface of the magnetic tape within said opening toward a position in which said pinch roller is pressed against a capstan for feeding said magnetic tape.

4,964,003

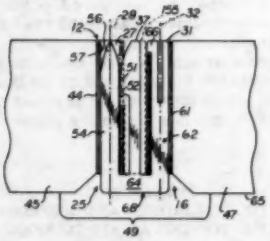
TAPE INTERCONNECTION SYSTEM

Warren D. Novak, Chappaqua, N.Y., assignor to Rank Video Services America, Northbrook, Ill.

Division of Ser. No. 211,545, Jun. 24, 1988, Pat. No. 4,920,436. This application Feb. 1, 1990, Ser. No. 473,424

Int. Cl.[5] G11B *15/66*

U.S. Cl. 360—96.1 **15 Claims**



1. An interconnection of a first tape with a second tape, comprising in combination:

a first joint permitting angular movement of said first tape relative to a remainder of said interconnection about a first axis;

a second joint permitting angular movement of said second tape relative to a further remainder of said interconnection about a second axis parallel to said first axis;

a stabilizing member between said first and second joints; and

means for rendering said interconnection disconnectable along said first axis extending through said first joint.

4,964,004

VIDEO COMPOSITION METHOD AND APPARATUS EMPLOYING VISUAL AND TACTILE FEEDBACK

Ronald C. Barker, Weston, Mass., assignor to Lex Computer and Management Corporation, Keene, N.H.

Continuation of Ser. No. 536,538, Dec. 2, 1983, abandoned. This application Jun. 16, 1989, Ser. No. 368,244

Int. Cl.[5] H04N *5/76*

U.S. Cl. 360—14.1 **3 Claims**

1. A composing apparatus for selecting segments from image source material stored in at least one storage medium and for denoting serially connected sequences of said segments, said composing apparatus comprising:

an operator input means;

a pictorial display means;

a composing control means responsive to said operator input means for controlling said storage media and said pictorial display means;

said operator input means comprising an operator controlled, manually operable, control panel having;

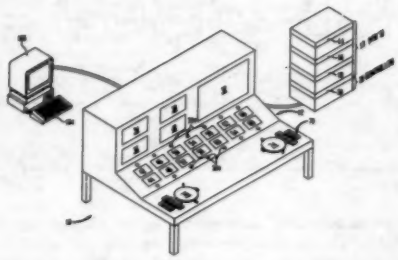
a first rotary control wheel; 'a second rotary control wheel;

a plurality of at least eight switch elements adjacent said first control wheel;

a second plurality of at least eight switch elements adjacent said second control wheel;

said first and second control wheels and said switch elements controlling said composing apparatus,

said first plurality of elements and said first control wheel having a first spatial configuration having a plurality of tactile subconfigurations for providing tactile stimulation



feedback to an operator of the apparatus regarding switch element location;

said second plurality of elements and said second control wheel having a second spatial configuration having a plurality of tactile subconfigurations for providing tactile stimulation feedback to said apparatus operator regarding switch element locations;

said first and second rotary control wheels including detents such that each movement of said control wheels corresponds to one second of said image source material such that said operator can maintain visual contact with the video displays while operating said input means;

said switch elements are alternately different sizes to provide positive positioning feedback of the operator's fingers;

whereby said operator can visually concentrate on said display means while operating said input means with minimal visual feedback.

4,964,005

INFORMATION RECORDING/REPRODUCING APPARATUS HAVING SWINGATE LEVERS FOR OPENING AND CLOSING SHUTTER OF CARTRIDGE IN RESPONSE TO INSERTION AND EJECTION OF CARTRIDGE

Kazuo Uzuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1987, Ser. No. 139,924

Claims priority, application Japan, Jan. 19, 1987, 62-8113; Jan. 19, 1987, 62-8114

Int. Cl.[5] G11B *5/012, 17/04*

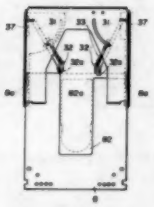
U.S. Cl. 360—99.06 **5 Claims**

1. An information recording/reproducing apparatus which is loadable with a cartridge including an information recording medium and a slidable cartridge shutter, and which performs at least one of recording and reproduction of information in and from the recording medium, said apparatus comprising:

a cartridge loading mechanism for inserting and ejecting the cartridge along a given path into and out from a holder in said apparatus;

a first swingable lever for swinging in first and second swinging directions in response to insertion and ejection, respectively, of the cartridge, for opening and closing the cartridge shutter;

a second swingable lever carried by a free end of said first swingable lever for swinging in directions opposite to the first and second swinging directions of said first swingable lever, a free end of said second swingable lever comprising a projection engageable with a notch on the cartridge shutter and an offset shoulder portion stepped from the projection only in the first swinging direction, the shoulder portion preventing said second swingable lever from swinging when the projection is engaged with the notch; and



biasing means for applying a biasing force to said second swingable lever in the first swinging direction of said first swingable lever.

4,964,006

MAGNETIC HEAD DEVICE

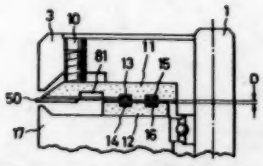
Hiroyuki Ota, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 185,654, Apr. 25, 1988, Pat. No. 4,194,537. This application Sep. 26, 1989, Ser. No. 412,365

Claims priority, application Japan, Apr. 24, 1987, 62-102497; May 21, 1987, 62-125335; May 21, 1987, 62-125336; May 28, 1987, 62-132795

Int. Cl.[5] G11B *5/20*

U.S. Cl. 360—108 **3 Claims**



1. A rotary head device comprising:

a rotary drum mounted on a shaft in such a manner that said rotary drum and said shaft rotate as one unit;

a first deflectable core secured to said rotary drum;

a first coil provided on said first deflectable core;

a stationary drum mounted on said shaft in such a manner that said stationary drum is not rotated by said shaft;

a second core secured to said stationary drum;

a second coil provided on said second core;

a joining member having one end portion secured to said first core;

a bridging core secured to the other end portion of said joining member;

a magnetic head secured to said bridging core; and

a screw threadedly engaged in said rotary drum and abutting against said joining member for depressing said joining member so as to adjust said magnetic head.

4,964,007

CRYSTALLIZED GLASS-BONDED AMORPHOUS METAL MAGNETIC FILM-NON-MAGNETIC SUBSTRATE MAGNETIC HEAD

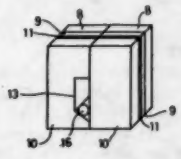
Mitsuo Satomi, Katano, and Nobuyuki Kaminaka, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 212,141, Jun. 13, 1988, Pat. No. 4,847,983, which is a continuation of Ser. No. 848,829, Apr. 7, 1986, abandoned. This application May 5, 1989, Ser. No. 348,599

Claims priority, application Japan, Apr. 8, 1985, 60-73877

Int. Cl.[5] G11B *5/127*

U.S. Cl. 360—125 **3 Claims**



1. A magnetic head, comprising:

at least four layers disposed in a layer-to-layer connected sandwich arrangement, each layer having two opposite faces and an outer peripheral edge, a length and width extending generally parallel to said faces thereof and a thickness extending generally perpendicular to said faces thereof;

said layers including, in series, a first non-magnetic substrate layer, an amorphous metallic magnetic film layer, a crystallized glass layer, and a second non-magnetic substrate layer;

said crystallized glass layer bonding said amorphous metallic magnetic film layer to said second non-magnetic substrate layer;

corresponding portions of each said outer peripheral edge of said four layers collectively providing a tape running surface;

said amorphous metallic magnetic film layer being divided into two laterally adjacent portions providing a gap extending completely through the thickness of said amorphous metallic magnetic film layer, said gap intersecting said outer peripheral edge of said amorphous metallic film layer whereby said tape running surface includes said gap;

said amorphous metallic magnetic film layer having a crystallizing temperature;

said crystallized glass layer being made of a glass which has an amorphous state from which it is crystallizable; said glass having, when in said amorphous state, a softening temperature which is lower than said crystallizing temperature of said amorphous metallic magnetic film layer, and said glass having, when in a crystallized state, a melting point which is higher than said softening temperature;

said crystallized glass layer having a thickness of 0.1 to 10 μm.

4,964,008

ROTATABLE MAGNETIC-HEAD UNIT FOR A MAGNETIC-TAPE APPARATUS

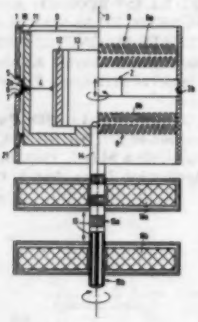
Budiman Sastra; Jacob G. Fijnvandraat; Leonardus H. M. Maaswinkel, all of Eindhoven, and Everhardus A. Muijderman, Geldrop, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 30, 1989, Ser. No. 304,397

Claims priority, application Netherlands, Jan. 29, 1988, 8800219

Int. Cl.[5] G11B *15/60, 5/52*

U.S. Cl. 360—130.24 17 Claims



1. A magnetic-head unit for a magnetic tape, comprising a cylindrical drum rotatable about an axis adapted to receive a magnetic tape wrapped over and moved past a part of the drum circumference, at least one magnetic head disposed substantially within the drum a cylindrical housing at least partly surrounding the drum and separated from the drum by a gap formed between opposed facing walls of the drum and housing, a spiral-groove bearing formed in one of the facing walls of the drum and the housing, and an opening in the housing through which the magnetic tape is guided as it moves past said part of the circumference of the drum.

4,964,009

MAGNETIC DISK HAVING AN INDEX AREA AND A LIMITED NUMBER OF RADIALLY EXTENDING SERVO SECTIONS

Kazunori Moriya, Yokohama; Nobuyuki Takagi, Koganei; Toshihiro Sugaya, Seki, and Norio Nakamura, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 259,429, Oct. 18, 1988, Pat. No. 4,896,240, which is a continuation of Ser. No. 911,120, Sep. 24, 1986, abandoned. This application Nov. 14, 1989, Ser. No. 436,035

Claims priority, application Japan, Sep. 24, 1985, 60-210424

The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.

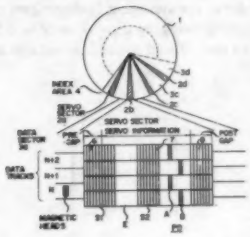
Int. Cl.[5] G11B *5/82*

U.S. Cl. 360—135 3 Claims

1. A magnetic disk comprising:

an index area provided in part of said magnetic disk, an index signal being recorded in said index area; and

a limited number of radially extending servo sections formed only in a partial area spanning only a limited angular region of said magnetic disk and each intervening between selected data sectors positioned subsequent to said index area, each of said servo sections having a servo information area in which a servo information pattern signal is formed, wherein an angular distance traversing each servo section from a first to a last servo section is smaller than an angular distance from the first to the last servo sections



when measured in an opposite direction not traversing said plural servo sections.

4,964,010

APPARATUS FOR LIMITING A TIME INTEGRATION VALUE OF A PULSED CURRENT

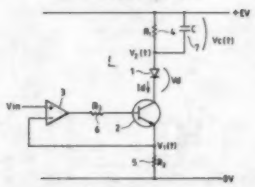
Katsuyuki Miyasaka, 35-31, Taishido 3-chome, Setagaya-ku, Tokyo, and Takuo Aoyagi, Tokyo, both of Japan, assignors to Katsuyuki Miyasaka and Nihon Kohden Corporation, both of Tokyo, Japan

Continuation of Ser. No. 201,152, Jun. 2, 1988, abandoned. This application Nov. 16, 1989, Ser. No. 437,301

Claims priority, application Japan, Jun. 5, 1987, 62-141233

Int. Cl.[5] G05F *1/00*

U.S. Cl. 361—18 8 Claims



1. An electronic device, comprising:

a circuit element;

means for supplying a pulse current to said circuit element;

means for supplying a constant current to said circuit element when a time integration value of the pulse current exceeds a predetermined value;

wherein said circuit element is a light emitting diode having an anode and a cathode; and

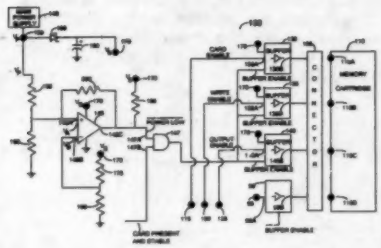
wherein said pulse current supplying means and said constant current supplying means together comprise a constant voltage source, a capacitor connected between said constant voltage source and the anode of said light emitting diode, a transistor having a base, a collector and an emitter, the collector being connected to said light emitting diode, and drive means for supplying a drive pulse current to the base of said transistor, whereby said transistor becomes saturated when the time integrated value of the pulse current supplied to said light emitting diode exceeds the predetermined value.

4,964,011

VOLTAGE TRANSIENT PROTECTION CIRCUIT

Daniel Sternglass, Ithaca, N.Y., assignor to Databook, Inc., Ithaca, N.Y.

Filed May 22, 1989, Ser. No. 354,753
Int. Cl.[5] H22H *3/18*
U.S. Cl. 361—88 4 Claims



1. A voltage transient protection apparatus for protecting a memory device from a plurality of different undesired control signals provided respectively on a plurality of different control signal paths to said memory device, said apparatus comprising:

a plurality of isolation means for isolating said memory device from said control signals in response to a first signal, each of said plurality of isolation means being situated in a different one of said plurality of control signal paths;

a primary voltage port for coupling to a primary voltage source of primary voltage;

transient detecting means for providing said first signal to said plurality of isolation means when a voltage transient occurs in said primary voltage and,

a capacitive secondary voltage source for supplying voltage to said transient detecting means and to said plurality of isolation means for a period of time sufficiently long while said primary voltage is fluctuating during a transient to permit said plurality of isolation means to achieve isolation of said control signals from said memory device,

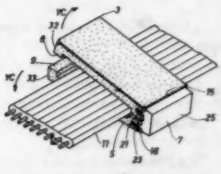
said transient detecting means being coupled to said primary voltage port to sense the primary voltage thereof and being further coupled to said secondary voltage source to receive voltage therefrom to power said transient detecting means.

4,964,012

ELECTRIC NOISE ABSORBER

Hiroji Kitagawa, Nagoya, Japan, assignor to Kitagawa Industries Co., Ltd., Aichi, Japan

Filed Sep. 8, 1989, Ser. No. 404,623
Claims priority, application Japan, Sep. 24, 1988, 63-125019[U]
Int. Cl.[5] H01F *17/06*
U.S. Cl. 361—113 20 Claims



17. An elastic noise absorber for absorbing noise on an electric cable comprising:

two bodies of magnetic substance having contacting inner surfaces, with a recess formed in the inner surface of at least one of the bodies such that the bodies surround the electric cable;

a joining surface between the two bodies;

engaging means formed on each body on opposite sides of said joining surface;

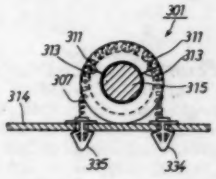
an elastic holding member that engages the engaging means, thereby pressing the bodies together at the joining surface.

4,964,013

ELECTRIC NOISE ABSORBER

Hiroji Kitagawa, Nagoya, Japan, assignor to Kitagawa Industries Co., Ltd., Aichi, Japan

Filed Sep. 8, 1989, Ser. No. 404,622
Claims priority, application Japan, Sep. 28, 1988, 63-126850[U]
Int. Cl.[5] H01F *17/06*
U.S. Cl. 361—113 22 Claims



1. An electric noise absorber for absorbing noise on an electric cord comprising:

a plurality of bodies of magnetic substance, each having an engaging indentation on its outer surface, which bodies contact each other such that they surround the cord;

an elastic holding member having two ends, with fasteners attached to each end, where the holding member engages the engaging indentations on the bodies such that the bodies are securely held together when the fasteners are fastened; and

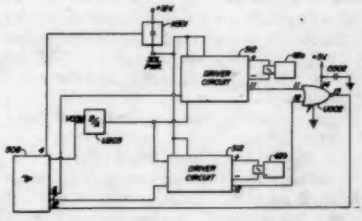
the engaging indentations have surfaces for preventing the holding member from moving in either direction along the longitudinal axis of the cord.

4,964,014

SOLENOID VALVE DRIVER

Thomas E. Boe, Grundy County, and Vijay M. Dharia, Cedar Falls, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 6, 1989, Ser. No. 294,527
Int. Cl.[5] H01H *47/22*
U.S. Cl. 361—187 3 Claims



1. A system for controlling an electrical current applied to a coil of a solenoid, comprising:

means for periodically energizing the coil;

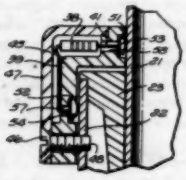
means for sensing actual current through the coil;
means for generating a reference current value corresponding to a desired peak coil current;
means for comparing the actual current to the reference current value and for generating a first signal when the actual current reaches the reference current value;
means for periodically de-energizing the coil in response to generation of the first signal; and
means for reducing the reference current value if no first signal is generated within a certain time period.

4,964,015

ELECTRICALLY CONDUCTIVE CHAIR SUPPORT WITH SLIDING BUSHING

Richard L. Crooker, Canyon Country, Calif., assignor to Zero Corporation, Los Angeles; Vincent J. Fitzgerld, Westminster; Jeffery D. Campbell, Hawthorne, all of Calif.

Filed Mar. 27, 1989, Ser. No. 328,574
Int. Cl.[5] H05F *3/00*; H01R *39/00*; A47C *1/00*
U.S. Cl. 361—220 **20 Claims**



10. In a chair having a support unit for adjusting the height of a chair seat above the floor, said support unit including an outer sleeve and an inner sleeve with said inner sleeve sliding vertically relative to said outer sleeve, the improvement comprising:

a collar carried on said outer sleeve and sliding along said inner sleeve, with said collar having a first inner annular groove around said inner sleeve and a second inner annular groove around said outer sleeve; and

an electrical resistance device carried in said collar and having a first electrically conducting spring means in said first groove and a second electrically conducting spring means in said second groove, and a resistor with two leads, with one lead connected to said first spring means and the other lead connected to said second spring means.

12. A bushing for outer and inner sleeves with said inner sleeve sliding and rotating relative to said outer sleeve, the bushing comprising:

a collar for carrying on said outer sleeve and sliding along said inner sleeve, with said collar having a first inner annular groove around said inner sleeve and a second inner annular groove around said outer sleeve; and

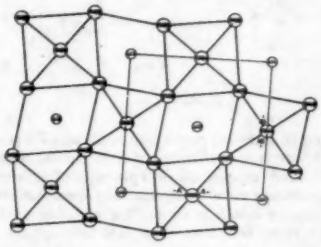
an electrical resistance device carried in said collar and having a first electrically conducting spring means in said first groove and a second electrically conducting spring means in said second groove, and a resistor with two leads, with one lead connected to said first spring means and the other lead connected to said second spring means.

4,964,016

MULTI-LAYER CERAMIC CAPACITORS HAVING, AS THE CONDUCTIVE ELEMENTS THEREIN, LAYERS OF PEROVSKITES CONTAINING OXYGEN AND NITROGEN

Roger Marchand, Cesson-Sevigne; Philippe Antoine, Aze; Paul L'Haridon, Vern Sur Seiche, and Yves Laurent, Cesson-Sevigne, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Division of Ser. No. 172,192, Mar. 23, 1988, abandoned. This application Jul. 14, 1989, Ser. No. 380,732
Claims priority, application France, Mar. 27, 1987, 87 04287
Int. Cl.[5] C01B *21/20*; H01G *4/12, 7/00*
U.S. Cl. 361—321 **12 Claims**



1. A multi-layer ceramic capacitor comprising at least one dielectric element and conductive elements in which said conductive elements comprise conductive perovskites containing oxygen and nitrogen, corresponding to the general formula I

$$AB(O,N)_3 \qquad (I)$$

in the cationic lattice of which:

A denotes a metal chosen from the metals of groups IA and IIA, yttrium and the lanthanides,

B denotes a metal chosen from the transition metals of groups IVA to IB,

on the express condition that at least one of the metals A and B is present in an oxidation state other than its normal maximum oxidation state.

8. Process for the preparation of a multilayer ceramic capacitor as claimed in claim **1** or **2**, wherein a mixed oxide of metals A and B is subjected to a nitriding in a stream of ammonia at a temperature of between 700° C. and 900° C. and the perovskites thus obtained is cosintered with a dielectric material.

4,964,017

ADAPTABLE HOUSING FOR EMBEDDING OF COMPUTER-CONTROLLED PRODUCTS

James A. Jindrick; L. Dennis Page, and Richard A. Daniel, all of Tucson, Ariz., assignors to Intelligent Instrumentation, Inc., Tucson, Ariz.

Filed Apr. 26, 1989, Ser. No. 344,234
Int. Cl.[5] H05K *5/00*
U.S. Cl. 361—390 **29 Claims**

1. An adaptable housing for a personal computer, comprising in combination;:

(a) a metal bottom section, opposed metal first and second side panels, and a removable metal cover;

(b) a removable metal front panel assembly attached to the bottom section and the first and second panels and having a plurality of openings therein;

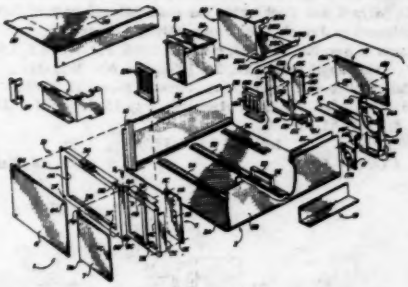
(c) a metal front face plate attached to an outer surface of the front panel assembly and covering a first opening therein;

(d) a removable metal rear panel assembly attached to the bottom section and the first and second side panels and having a plurality of openings therein, and first and second

mounting flanges extending rearward from opposed edges of a first opening therein;

(e) a metal rear face plate attached to the first and second mounting flanges of the rear panel assembly and partially covering the first opening therein;

(f) a computer board attached in fixed relation to the bottom section, and having thereon a first connector;



(g) a card cage supported above a portion of the bottom section adjacent to the rear panel assembly, having a slot, and carrying a first printed circuit board inserted into the slot, the first printed circuit board having a second connector;

(h) means for supporting the card cage;

(i) means or electrically coupling the first connector to the second connector.

4,964,018

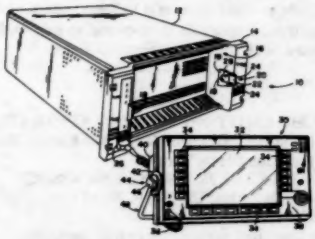
MULTI-PURPOSE DISPLAY MODULE SYSTEM FOR AN ELECTRONIC INSTRUMENT

Robert L. Mallory; Gary D. Basey, both of Portland, and Robert L. Gainer, West Linn, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 5, 1989, Ser. No. 417,354

Int. Cl.[5] H02B *1/04*

U.S. Cl. 361—391 **4 Claims**



1. A multi-purpose display module system for an electrical instrument having a main chassis comprising:

a front frame fixedly attached to the front of the main chassis, the front frame having a recess and opposing slots at either end of a rotational axis across the recess;

a display module for detachably, rotatably mounting within the recess;

a pair of latches attached to the main chassis and extending through the opposing slots;

a pair of clutch assemblies frictionally, rotatably mounted on the display module so that when the display module is mounted within the recess the clutch assemblies are fixedly engaged by the latches; and

means for electrically connecting the display module to the electrical instrument.

4,964,019

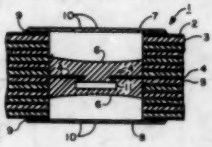
MULTILAYER BONDING AND COOLING OF INTEGRATED CIRCUIT DEVICES

Thomas D. Belanger, Jr., Saline, Mich., assignor to AG Communication Systems Corporation, Phoenix, Ariz.

Filed Dec. 27, 1989, Ser. No. 457,626

Int. Cl.[5] H05K *1/18*

U.S. Cl. 361—401 **7 Claims**



1. In combination:

A multilayer printed wiring board including:

a top layer;

a bottom layer;

and at least one intermediate layer;

each of said layers including a top and bottom surface, an electrically insulating portion and a plurality of electrical conductor circuit elements superimposed on at least one of said surfaces;

an aperture extending through at least a portion of said multilayer printed wiring board and including said bottom layer and a portion of said intermediate layer;

a portion of said intermediate layer electrical conductor circuit elements projecting into said aperture;

and an integrated circuit element positioned within said aperture, electrically connected to and supported by a portion of said intermediate layer electrical conductor circuit elements projecting into said opening.

4,964,020

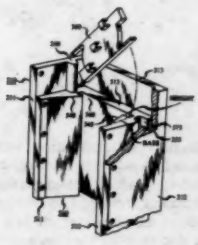
EQUIPMENT RACK

Dale A. Savage, Fort Lauderdale, Fla., and Sidney H. Spencer, Reisterstown, Md., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 27, 1989, Ser. No. 413,512

Int. Cl.[5] H02B *1/01*

U.S. Cl. 361—429 **12 Claims**



1. Apparatus for holding electronic equipment comprising:

a first frame member, generally U-shaped in cross section, including a first pair of arms and first enclosing means connected to said first pair of arms, for partially enclosing at least a portion of the space between said first pair of

arms, whereby a first partially enclosed channel is formed between said first pair of arms;

a second frame member, generally U-shaped in cross section, including a second pair of arms;

connecting means for connecting at least one pair of ends of said frame members to each other; and

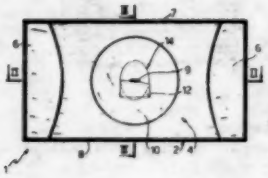
first bundling means positioned in said first channel, for bundling cables.

4,964,021

MOTOR VEHICLE HEADLIGHT

Valter Masin, Turin, Italy, assignor to Carello S.p.A., Turin, Italy

Filed Nov. 21, 1989, Ser. No. 439,496
Int. Cl.[5] B60Q *1/04*
U.S. Cl. 362—61 3 Claims



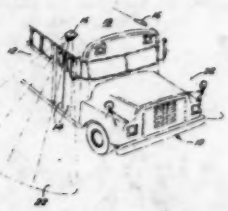
1. A motor vehicle headlight comprising a reflecting body (2), in turn comprising a paraboloid of translation (4) with inclined lateral end walls (6), and a light source (9) located centrally along the focal axis (5) of said paraboloid (4); characterised by the fact that it also comprises a spherical reflector (14) formed centrally on said paraboloid (4) and behind said light source (9); a condensing lens (10) located ahead of said light source (9); and a diaphragm (12) located between said condensing lens (10) and said light source (9); the respective focus points (11, 16) of said condensing lens (10) and said spherical reflector (14) being located between said diaphragm (12) and said light source (9).

4,964,022

BUS SIDE LIGHT SYSTEM

Robert Lane, P.O. Box 441, Granger, Ind. 46530

Filed Apr. 10, 1989, Ser. No. 335,550
Int. Cl.[5] B60Q *1/02*
U.S. Cl. 362—80 2 Claims



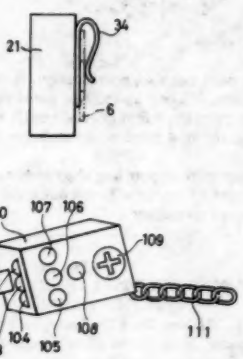
1. In combination, a transportation vehicle and lighting system, said combination wherein said vehicle includes one or more side doors through which passengers of the vehicle enter and exit, a light housing mounted to one side of said vehicle and positioned above at least one of said doors, said light housing including electrical lighting means for directing a wide beam of light laterally outwardly from said vehicle along the vehicle at each side and forwardly thereof, wherein said lighting means includes two sealed beam lights carried within said light housing and positioned with respect to each other in angularly displaced manner so as to produce said wide beam of light directed along the side of said vehicle and laterally outwardly from said vehicle for a distance of at least one width of said vehicle, each of said sealed beam lights including a housing having a transparent lens, said sealed beam lights carried by said light housing such that front lenses of said sealed beam lights constitutes a front face for said light housing.

4,964,023

HOLDER WITH SEMICONDUCTOR LIGHTING DEVICE

Junichi Nishizawa, No. 6-16, Komegafukuro 1-chome, Sendai-shi, Miyagi, and Yoshikatsu Tamaoki, Miyagi, both of Japan, assignors to Junichi Nishizawa, Miyagi, Japan

Division of Ser. No. 929,884, Nov. 13, 1986, Pat. No. 4,831,504.
This application Dec. 28, 1988, Ser. No. 291,022
Claims priority, application Japan, Nov. 13, 1985, 60-175511[U]; Mar. 25, 1986, 61-66154; May 15, 1986, 61-113237; Jul. 8, 1986, 61-161720
Int. Cl.[3] F21V *33/00*
U.S. Cl. 362—100 14 Claims



1. A locking/unlocking device, comprising:

a key;

lighting means detachably attached to said key;

a signal generator for impressing a predetermined signal upon light emitted from said lighting means; and

a locking device operable in response to said emitted light impressed with said predetermined signal.

4,964,024

LIGHT EMITTING WRITING APPARATUS

Huang-Hsien Tsay, 9, Lane 1042, Wu-Kuang Rd. Wu-Jih Shiang, Taichung Shien, Taiwan

Filed Jan. 26, 1990, Ser. No. 470,587
Int. Cl.[5] B43K *29/10*
U.S. Cl. 362—118 4 Claims

1. A light emitting writing apparatus, including:

a pen-holder being a hollow cylinder having an opening at its one end, a longitudinal groove on its inner wall surface, and a through-hole through its side-wall;

a front socket having a hollow, conical structure comprising a connecting end fastening in the opening of said pen-holder;

a cylinder received in said pen-holder to slide along said groove and comprising a raised strip having two conductive leaves disconnectedly mounted thereon;

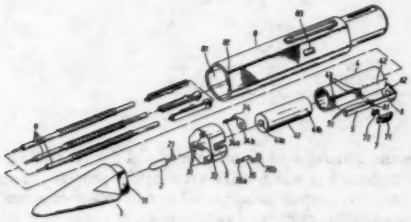
a button slider being received in said pen-holder and having a raised portion set to protrude beyond the through-hole of said pen-holder and a conductive plate on its bottom alternatively pressing on the two conductive leaves of said

cylinder, said button slider being pushed to slide in the through-hole of said pen-holder so as to connect or disconnect said two conductive leaves;

a dry battery received in said cylinder;

a holder plate received in said pen-holder and comprising a plurality of through-holes for the positioning therein of a plurality of writing elements, and a recess hole having two wire holes penetrating therethrough;

a lamp bulb set in the recess hole of said holder plate with its two conductors respectively received in the two wire holes of said recess;



two connecting members respectively inserted in the two wire holes of said recess to connect to the two conductors of said lamp bulb;

wherein one of said connecting members is connected with the positive end of said dry battery and the other connecting member is connected with one of said two conductive leaves while the other conductive leaf is connected with the negative end of said dry battery; and

wherein the moving of said button slider in the through-hole of said pen-holder controls the connection of the negative end of said battery to its positive end through said lamp bulb so as to turn on said lamp bulb to produce light.

4,964,025

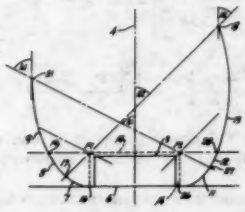
NONIMAGING LIGHT SOURCE

George E. Smith, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 254,349, Oct. 5, 1988. This application Nov. 1, 1989, Ser. No. 429,973

Int. Cl.[5] F21V *7/00*

U.S. Cl. 362—346 **12 Claims**



3. A flux extractor cup for extracting light efficiently from an LED positioned on an optical axis within an axially symmetrical virtual positioning envelope and for directing light emitted by the LED within a flux path which is asymmetrical relative to the optical axis, the cup being asymmetrical with at least one high lip portion and one low lip portion;

a flat section located at the bottom of the cup and normal to the optical axis, the flat section having a width equal to a diameter of the positioning envelope;

an LED mounted on the bottom of the cup within the positioning envelope;

and comprising in at least one side of a first longitudinal cross section:

a circular section extending from the flat section to a lower point located at an intersection with a line from the opposite cup lip through a nearest edge point of a top surface of the positioning envelope, the circular section having a constant radius and a center at the nearest edge point;

a lower parabolic section extending from the lower point to an upper point located at an intersection of the cup surface with a projection of the top surface of the positioning envelope, the lower parabolic section having a vertex at the lower point, an axis projecting through the nearest edge point and the lower point, and a focus at the nearest edge point; and

an upper parabolic section extending from the upper point to the nearer cup lip, the upper parabolic section having a vertex at the nearer cup lip, an axis extending through the farthest edge point and parallel to the axis of the lower parabolic section, and a focus located at the farthest edge point of the top surface of the positioning envelope;

and comprising in at least one side of a second longitudinal cross section different from the first longitudinal cross section:

a circular section extending from the flat section to a lower point located at an intersection with a line from the opposite cup lip through a nearest edge point of a top surface of the positioning envelope, the circular section having a constant radius and a center at the nearest edge point;

a lower parabolic section extending from the lower point to an upper point located at an intersection of the cup surface with a projection of the top surface of the positioning envelope, the lower parabolic section having a vertex at the lower point, an axis projecting through the nearest edge point and the lower point, and a focus at the nearest edge point; and

an upper parabolic section extending from the upper point to the nearer cup lip, the upper parabolic section having a vertex at the nearer cup lip, an axis extending through the farthest edge point and parallel to the axis of the lower parabolic section, and a focus located at the farthest edge point of the top surface of the positioning envelope.

4,964,026

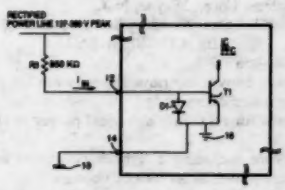
NOISE REDUCTION TECHNIQUE FOR PWM CONTROLLERS

James J. Locascio, San Jose, Calif., assignor to Micro Linear Corporation, San Jose, Calif.

Filed Sep. 13, 1989, Ser. No. 406,776

Int. Cl.[5] H02M *3/335*

U.S. Cl. 363—39 **4 Claims**



1. A linear circuit architecture comprising:

a. a first linear circuit having a first ground;

b. a current limiting input impedance coupled in series to receive a linear signal from the first linear circuit for forming a reduced linear signal and further wherein the

current limiting input impedance is a resistor which is not connected to the first ground; and

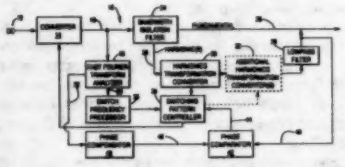
c. a second linear circuit having a second ground and an input circuit coupled to receive the reduced linear signal from the current limiting impedance.

4,964,027

HIGH EFFICIENCY POWER GENERATING SYSTEM

Alexander Cook; John N. Rice, and David H. Hitt, all of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 5, 1989, Ser. No. 446,430
Int. Cl.[5] H02M *1/12, 1/14*
U.S. Cl. 363—40 **34 Claims**



1. A power generating system comprising:

a converter for producing an AC output including a fundamental and at least one harmonic of the fundamental in response to applied control signals;

a frequency analyzer, having at least one input coupled to the AC output, for providing an analysis of a frequency spectrum of the AC output;

a processor, coupled to the frequency analyzer, for calculating at least one switching frequency, each switching frequency being used for transforming a different harmonic within the AC output to the fundamental;

a controller, responsive to the at least one calculated switching frequency, for producing control signals at the at least one calculated switching frequency for transforming the at least one harmonic back to the fundamental and control signals for the converter for producing the AC output;

a separating filter, coupled to the AC output, for separating the AC output into the fundamental and the at least one harmonic;

at least one additional converter, coupled to the at least one harmonic from the converter and to the controller, each converter being switched by control signals from the controller which have a calculated switching frequency for transforming one of the at least one harmonics to the fundamental; and

outputs from the at least one converter being combined with the fundamental from the separating filter.

4,964,028

CURRENT LIMITED QUASI-RESONANT VOLTAGE CONVERTING POWER SUPPLY

Vincent J. Spataro, Bergenfield, N.J., assignor to Plessey Electronic Systems Corp., Wayne, N.J.

Filed Oct. 26, 1989, Ser. No. 426,729
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—056 **2 Claims**

1. A voltage converting power supply having current limiting characteristics comprising:

input means for receiving electrical power at an input voltage;

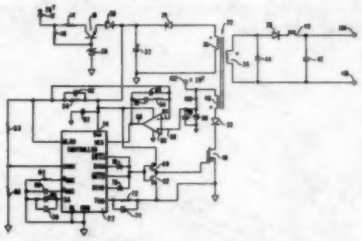
output means including a flyback converter for providing electrical power at an output voltage;

controllable switch means for providing a current path to effect the transfer of power from said input means to said output means, wherein said switch means is controllable to provide said current path at a variable frequency and the amount of power being transferred is dependent on the frequency at which said current path is provided; and

control means for controlling said switch means including:

means for providing a reference voltage;

means for comparing said output voltage with said reference voltage and providing a comparison signal representative of the difference therebetween;



means utilizing said comparison signal for controlling the frequency at which said current path is provided to maintain said output voltage equal to said reference voltage;

means for operating said switch means in a half-wave mode; and

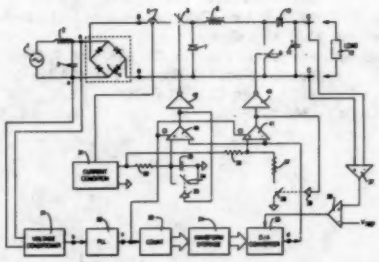
means for limiting the maximum frequency at which said current path is provided.

4,964,029

AC TO DC POWER CONVERTER WITH INPUT CURRENT WAVEFORM CONTROL FOR BUCK-BOOST REGULATION OF OUTPUT

Alex Severinsky, Silver Spring, and Kaushik Rajashekara, Greenbelt, both of Md., assignors to Viteq Corporation, Lanham, Md.

Filed May 18, 1988, Ser. No. 195,160
Int. Cl.[5] G05F *1/565*
U.S. Cl. 363—80 **6 Claims**



1. An AC to DC power converter for converting AC line voltage at an input to a DC voltage at an output; said converter comprising:

rectifying means for rectifying the AC voltage;

first switching means operated at a frequency substantially higher than the frequency of said input AC voltage for controlling the DC voltage delivered to said output;

second switching means operated at a frequency substantially higher than the frequency of said input AC voltage for controlling the DC voltage delivered to said output;

current sensing means for sensing the input current;

reference waveform generating means for generating a predetermined waveform, said reference waveform generator includes storage means for storing digital data repre-

senting a predetermined waveform, wherein said storage means is addressable by address means for addressing said storage means, said address means being controlled in accordance with the frequency and phase of said input AC voltage;

control means coupled to said current sensing means and said reference waveform generating means for controlling the operation of said first switching circuit and said second switching circuit; and

frequency control means for providing a frequency corresponding to the frequency of said input AC voltage, said frequency control means being used to control said address means, wherein said frequency control means is a phase lock loop.

4,964,030

APPARATUS FOR TRANSLATING SENTENCES CONTAINING PUNCTUATION MARKS

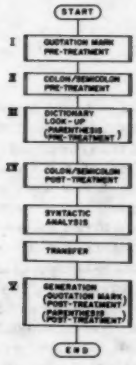
Hitoshi Suzuki; Shinobu Shiotani; Shinji Tokunaga, all of Nara; Tokuyuki Hirai, Yamatokoriyama; Yoji Fukumochi, Nara; Shuzo Kugimiya, Nara, and Ichiko Sata, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 27, 1987, Ser. No. 126,262

Claims priority, application Japan, Nov. 28, 1986, 61-284484; Nov. 28, 1986, 61-284485; Nov. 28, 1986, 61-284491

Int. Cl.[5] G06F *15/38*

U.S. Cl. 364—419 **10 Claims**



3. A translation system for translating a sentence of an original language into a sentence of a target language comprising:

numbering means for providing a serial number position to each word in the sentence of the original language;

detecting means for detecting a pair of quotation marks within the original language sentence;

storing means for storing said serial number positions of the detected quotation marks;

deleting means for deleting the detected quotation marks from the original language sentence to create a modified original language sentence;

translation means for translating said modified original language sentence into the target language sentence; and

adding means for adding quotation marks into the translated target language sentence at positions corresponding to the stored serial number positions.

4,964,031

METHOD OF STARTING A GROUP OF LOOMS

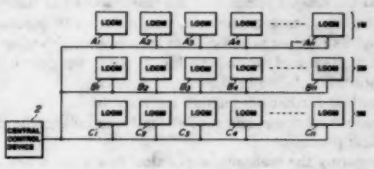
Miyuki Gotoh, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 7, 1988, Ser. No. 254,900

Claims priority, application Japan, Oct. 9, 1987, 62-255563

Int. Cl.[5] G05B *19/40*; G06F *15/46*

U.S. Cl. 364—138 **7 Claims**



6. A method of starting a group of looms each having a control circuit in electrical connection with a central control device, comprising the following steps:

programming in the central control device a starting procedure including a predetermined order according to which operations of respective looms are started;

commencing execution of the starting procedure in the central control device; and

successively outputting operation command signals in the predetermined order from the central control device to the loom control circuits in response to the commencing step, each operation command signal causing each loom to be started, upon completion of preparation for starting a loom.

4,964,032

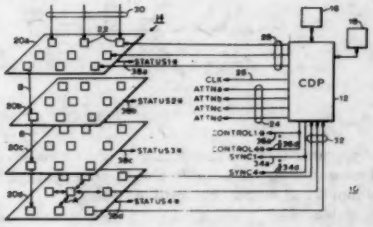
MINIMAL CONNECTIVITY PARALLEL DATA PROCESSING SYSTEM

Harry F. Smith, 7 Fern La., Newtown, Conn. 06470

Division of Ser. No. 31,035, Mar. 27, 1987. This application Nov. 14, 1988, Ser. No. 270,850

Int. Cl.[5] G06F *9/00*

U.S. Cl. 364—200 **2 Claims**



1. In a parallel data processing system comprised of at least a two dimensional array of data processing cells, each of the cells comprising a plurality of input and output communication signal lines for electrically coupling to at least all immediately neighboring cells, at least one cell disposed at a unique position at an edge of the array having input communication signal lines coupled to a predetermined logic state, a method of determining by the control data processor that at least one of the cells of the array is inoperable, the method comprising the steps of:

initially resetting the cells of the array to a common processing state;

determining by each of the cells a position of the cell within the array, the step of determining a position including the steps of:

initiating an input signal line logic state determination processing state within all of the cells of the array;

detecting, by the at least one cell at the edge of the array, the predetermined logic state;

determining from the detected predetermined logic state that the cell is located at the unique position within the array;

communicating the position of the cell to at least one other neighboring cell whereby the cell so communicated to is enabled to determine its position within the array relative to the unique position of the cell disposed at the edge of the array, each of the cells within the array communicating its relative position to at least one neighboring

cell until each of the cells within the array has determined its position relative to the unique position;

the method further comprising the steps of:

transmitting the position of at least one cell to the control data processor;

comparing the transmitted position to a known position of the at least one cell; and

determining that at least one cell of the array is inoperative if the transmitted position does not equal the know position.

4,964,033

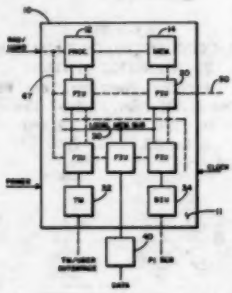
MICROPROCESSOR CONTROLLED INTERCONNECTION APPARATUS FOR VERY HIGH SPEED INTEGRATED CIRCUITS

Paul F. Williams, Burnsville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 3, 1989, Ser. No. 293,077

Int. Cl.[5] G06F *13/00*

U.S. Cl. 364—200 **4 Claims**



1. Apparatus for interconnecting at least two very high speed integrated circuit chips in a multi-chip package having digital inputs and outputs comprising:

a local data bus;

a microprocessor;

a digital memory connected to the microprocessor;

a plurality of modular functional interface units wherein at least one of the modular functional interface units is connected between the local bus and the microprocessor and the other modular functional interface units are connected between the local bus and one of the integrated circuit chips, wherein all of the modular function interface units are responsive to control commands from the microprocessor so as to pass data from one integrated circuit chip to another by routing through a first connected functional interface unit to the local data bus and out through at least one other functional interface unit to its connected integrated circuit chip, and wherein the modular functional interface units are structured and arranged to provide uniform input/output ports for all of the interconnected integrated circuit chips so as to simplify routing and input/output requirements.

4,964,034

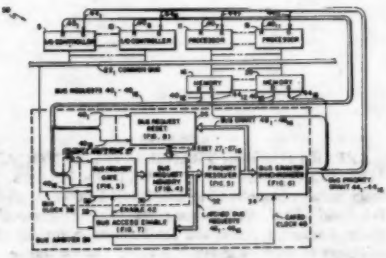
SYNCHRONIZED PROCESSING SYSTEM WITH BUS ARBITER WHICH SAMPLES AND STORES BUS REQUEST SIGNALS AND SYNCHRONIZES BUS GRANT SIGNALS ACCORDING TO CLOCK SIGNALS

Kenneth R. Jaskowiak, Milford, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 45,794, Apr. 20, 1987, abandoned, which is a continuation of Ser. No. 666,531, Oct. 30, 1984, abandoned. This application Aug. 25, 1988, Ser. No. 237,675

Int. Cl.[5] G06F *13/18, 13/36*

U.S. Cl. 364—200 **16 Claims**



4. In combination:

a bus;

a plurality of devices including memories, processors, and I/O controllers operating asynchronously and interconnected by said bus, each one of said devices produces a bus access request signal on a bus access request line connected to an output thereof when said one of the devices requests access to said bus, and each one of said devices being granted access to said bus in response to a bus access grant signal fed to said one of the devices on a bus access grant line connected to an input of said one of the devices;

means, having an input connected to said bus access request line of each one of said plurality of devices for storing the bus access request signal on said bus access request line in response to a sample signal generated in accordance with a continuous clock signal originating from said bus and providing there are no previously stored bus access request signals waiting to be processed;

means, responsive to said stored bus access request signals, for converting the stored bus access request signals into a priority sequence of bus access grant signals on said bus access grant lines, said bus access grant lines being coupled to the devices requesting access to the bus;

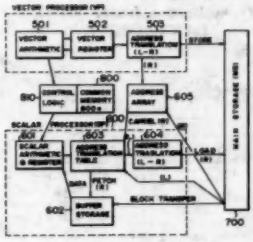
means coupled to an output of said storing means for producing the sample signal in accordance with said clock signal and the absence of any stored bus access request signals, each sample signal being produced after all of said bus access request signals stored in response to a preceding sample signal have been converted into said priority sequence of bus access grant signals; and

means coupled to said priority converting means and said sample signal producing means for synchronizing in accordance with said clock signal said prioritized bus access grant signals coupled to said plurality of devices.

4,964,035
VECTOR PROCESSOR CAPABLE OF HIGH-SPEED ACCESS TO PROCESSING RESULTS FROM SCALAR PROCESSOR

Tomoo Aoyama, and Hiroshi Murayama, both of Hadano, Japan, assignors to Hitachi, Ltd. and Hitachi Computer Engineering Co., Ltd., both of Tokyo, Japan

Filed Apr. 7, 1988, Ser. No. 178,569
Claims priority, application Japan, Apr. 10, 1987, 62-86893
Int. Cl.[5] G06F 15/347, 15/16, 9/38
U.S. Cl. 364—200 7 Claims



1. A vector processing system having a main storage, a scalar process for executing scalar instructions, a vector processor for executing vector instructions, and address translation units respectively provided in said processors to be respectively located between said processors and said main storage comprising:

common memory means having a plurality of logical partitions for storing vector data including a plurality of elements each representing a portion thereof specifiable by a given field of an instruction on data to be accessed, said common memory means being accessible from resources provided in each of said processors without intervention of said address translation units;

access control means cooperative with said common memory means for detecting a conflict between an access request issued from a resource of said vector processor and an access request issued from a resource in said scalar processor to said common memory means for providing one of said conflicting access requests with an access right for each of said logical partitions of said common memory means in accordance with a predetermined logic for access right; and

decode control means responsive to said access control means for permitting a decode operation of an instruction defining operations of said scalar or said vector processor based on information of access right given to an access request held in said access control means to provide a decoded instruction to the respective resource for execution.

4,964,036
CHANNEL HARDWARE DIAGNOSTIC APPARATUS AND METHOD

Joao B. De Azevedo, Jr., Endicott, N.Y., and Peter N. James, Algonquin, Ill., assignors to International Business Machines Corporation, Armonk, N.Y.

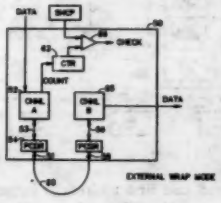
Filed Dec. 21, 1988, Ser. No. 290,419
Int. Cl.[5] G06F 11/00, 3/00
U.S. Cl. 364—200 5 Claims

1. In a computer I/O system with a plurality of channels for conducting data between a computer memory and a plurality of inputting, outputting, and storage devices, said system including a shared channel means for initiating and controlling I/O transfer operations of said channels by provision of a plurality of mode signals, control signals, and data signals to said channels, an improvement for using a first channel to determine the status of a second channel, each of said first and second channels including an external interface for connection to an I/O unit, said improvement comprising:

in each of said first and second channels, an input buffer means connected to the channel's external interface for buffering IN control signals from an I/O unit;

in each of said first and second channels, an output buffer means connected to the channel's external interface for buffering OUT control signals to an I/O unit;

in each of said first and second channels, logic means connected to the channel's input and output buffer means and to said shared channel means for providing a sequence of OUT control signals through the channel's output buffer means in response to a first mode signal and to a sequence of IN control signals received through the channel's input buffer means, said first mode signal being provided by said shared channel means and indicating a non-interlocked



data streaming transfer procedure initiated by a first IN control signal sequence from an I/O unit;

external connection means connectable to the external interfaces of said first and second channels for conducting OUT control signals from the output buffer of said first channel to the input buffer of said second channel and for conducting OUT control signals from the output buffer of said second channel to the input buffer of said first channel; and

diagnostic signal means in at least said first channel and connected to said shared channel means and to the logic means in said first channel and responsive to said first mode signal and to a second mode signal, said second mode signal being provided by said shared channel means and being indicative of a diagnostic data streaming test for initiating said diagnostic data streaming test by providing a facsimile of said first IN control signal sequence to the logic means of said first channel.

4,964,037
MEMORY ADDRESSING ARRANGEMENT

William E. Woods, Natick; Richard A. Lemay, Carlisle, and David A. Wallace, Chelmsford, all of Mass., assignors to Bull HN Information Systems Inc. and Hutton/PRC Technology Partners 1, both of Billerica, Mass.

Filed Feb. 27, 1987, Ser. No. 19,898
Int. Cl.[5] G06F 13/00
U.S. Cl. 364—200 1 Claim

1. An memory for use in an electronic data processing system which comprises, in combination,

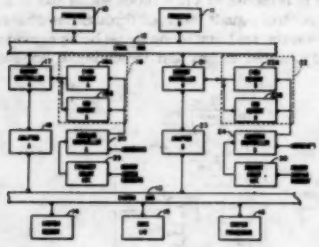
first and second random access memories each having an address input and a data port, each of said memories being capable of storing fixed length units of binary data at addressable storage locations specified by addresses applied to said address input,

means for writing data into said first and second memories comprising a source of a sequence of units of data and a source of a sequence of address values corresponding to said units, and means for writing units associated with even-numbered addresses into said first memory and for writing units associated with odd-numbered addresses into said second memory, and

means for reading units of data from said memory comprising, in combination,

a source of address values, and

means for concurrently applying first and second addresses to the address inputs of said first and second memories to permit units of data to be read concurrently from said first and second memories, said first and said second addresses being derived from the high-order bits of each given address value from said source such that, when said given address is even-numbered said first and second addresses are equal in value and, when said given address value is



odd-numbered said first address is incremented by one, thereby insuring that the unit specified by said given address and the unit specified by said given address plus one are always read concurrently from said first and second memories;

wherein each of said fixed length units of data comprises a pair of eight-bit bytes, and wherein the least significant bit value of each of said address values specifies the particular eight-bit byte within a particular unit and the next-to-least significant digit specifies whether the unit address is odd or even, and the remainder of said address value is used to generate said first and second addresses.

4,964,038

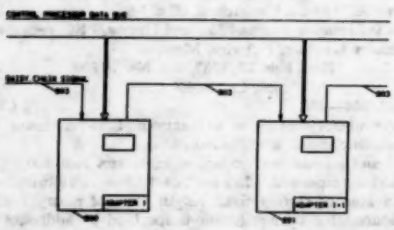
DATA PROCESSING SYSTEM HAVING AUTOMATIC ADDRESS ALLOCATION ARRANGEMENTS FOR ADDRESSING INTERFACE CARDS

Philippe P. R. Louis; Gerard M. Montanari, both of Cagnes-sur-Mer, and Robert L. Leotard, Vence, all of France, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 28, 1987, Ser. No. 113,310

Int. Cl.[5] G06F 3/00

U.S. Cl. 364—200 **18 Claims**



1. A data processing system comprising: a bus; a processor connected to said bus; and an interface card connected to said bus for communicating with said processor, said interface card comprising decoding means for computing a random address during an initialization sequence so that said interface card gets a unique address and for using said random address to decode an address on said bus so that said processor addresses said interface card.

4,964,039

APPARATUS FOR PROCESSING CODE DATA ASSOCIATED WITH MANAGEMENT DATA INCLUDING IDENTIFICATION DATA

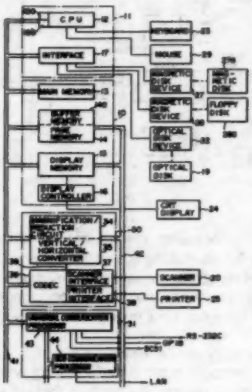
Koji Izawa; Shiro Takagi, both of Yokohama, and Tadanobu Kamiyama, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 13, 1988, Ser. No. 243,867

Claims priority, application Japan, Sep. 14, 1987, 62-230027

Int. Cl.[5] G06F 1/00

U.S. Cl. 364—200 **19 Claims**



1. An information processing apparatus for processing code data, comprising:

means for receiving a plurality of code data each having a data format inherent thereto;

means, coupled to said receiving means, for associating each code data with management data including identification data representing the inherent data format; and

means, coupled to said associating means, for storing the plurality of code data and the associated management data.

4,964,040

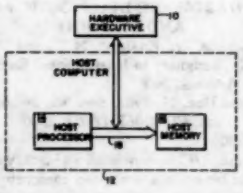
COMPUTER HARDWARE EXECUTIVE

Dwight R. Wilcox, San Diego, Calif., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 3, 1983, Ser. No. 455,438

Int. Cl.[5] G06F 9/22

U.S. Cl. 364—200 **23 Claims**



1. In a computer system including a host computer processor connected to a host computer memory via a host memory bus, the improvement comprising computer hardware executive

means connected to said memory bus for implementing executive functions in said computer system, said computer hardware executive means comprising:

memory mapped interface means for providing a connection between said memory bus and said computer hardware executive;

microsequence control logic means coupled to said memory mapped interface means for enabling programmable control of said computer hardware executive and containing a set of operation algorithms based on a set of parameters;

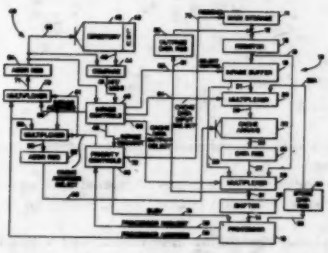
associative memory logic means coupled to said microsequence control logic means for storing entries in computer executive tables and for retrieving, sorting, making comparisons against and modifying the entries in the computer executive tables as directed by the microsequence control logic means; and register logic means coupled to the microsequence control logic means for storing, retrieving and modifying the parameters of the operation algorithms as directed by the microsequence control logic means.

4,964,041

INTERRUPTIBLE CACHE LOADING TO ASSURE IMMEDIATE DATA ACCESS FROM CACHE

Thomas L. Jeremiah; Albert J. Ruane, both of Endwell, and Frank A. Zurla, Binghamton, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Aug. 24, 1987, Ser. No. 88,753
Int. Cl.[5] G06F *1/00*
U.S. Cl. 364—200 **11 Claims**



1. A system which operates on clock cycles and which provides immediate access to data which is already located in a high speed memory device including:

processor means for processing data;

storage means for storing data and which is operatively connected to said data processing means;

a high speed cache memory operatively connected through a first bus to said storage means for storing at least a subset of data from said storage means, with each unit of said data requiring multiple clock cycles to be loaded through said first bus into said cache memory, with said cache memory accessible to said processor means through a second bus; and

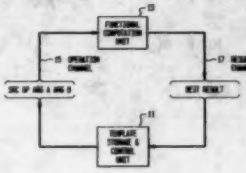
priority control means comprising logic circuits connected with both said processor means and said cache memory for monitoring data requests received from said processor means and for immediately interrupting in a given clock cycle any further loading of a unit of said data from said storage means to said cache memory only whenever such a data request is for data located in said cache memory, and for preventing any delay after said given clock cy le by allowing the data request for data located in said cache memory to be carried out concurrently with said interrupting and by allowing resumption of loading of said unit of data during successive clock cycles following said given clock cycle.

4,964,042

STATIC DATAFLOW COMPUTER WITH A PLURALITY OF CONTROL STRUCTURES SIMULTANEOUSLY AND CONTINUOUSLY MONITORING FIRST AND SECOND COMMUNICATION CHANNELS

Thomas L. Sterling, Crofton, Md., and Ellery Y. Chan, Melbourne, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Aug. 12, 1988, Ser. No. 231,673
Int. Cl.[5] G06F *9/30, 15/82*
U.S. Cl. 364—200 **25 Claims**



2. A data processing system comprising:

a functional computation unit in which data processing operations are executed on operand data in accordance with an opcode supplied thereto, so as to produce output data representative of the result of the execution of a data processing operation;

a storage unit in which are stored a plurality of data processing execution control structures each of which comprises a plurality of entries including an address for identifying that data processing execution control structure, an opcode for defining a data processing operation to be performed by said functional computation unit, a plurality of operand source addresses for specifying the addresses of data processing execution control structures containing operands to be employed in the execution of said defined data processing operation, the status of said data processing execution control structure with respect to its associated data processing operation and a result entry in which the output data produced by said functional computation unit as a result of its execution of a data processing operation requested by that data processing execution control structure is stores;

a first communications channel, coupled between said storage unit and said functional computation unit, and being monitored simultaneously by each of the data processing execution control structures of said storage unit, for conveying data processing request messages from said storage unit to said functional computation unit;

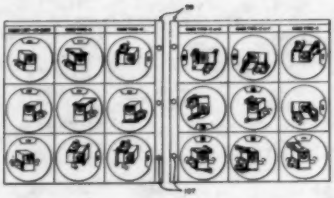
a second communications channel, coupled between said functional computation unit and said storage unit, and being monitored simultaneouly by each of the data processing execution control structures of said storage unit, for conveying output data from said functional computation unit to said storage unit; and

a control unit, coupled with said storage unit, for controllably causing a data processing message to be asserted onto said first communication channel in accordance with the contents of a selected one of said data processing execution control structures, said data processing message including the contents of the address and opcode entries of said selected data processing execution control structure and operands specified in accordance with the operand source address entries of said selected data processing execution control structure, and for causing output data, produced by said functional computation unit as a result of a data processing operation executed in accordance with said data processing message and asserted onto said second communications channel by said functional computation unit, to be captured in the result entry of said selected data processing structure.

4,964,043
SYSTEM FOR VISUALIZING, IDENTIFYING AND ORDERING GEARING CONFIGURATIONS

Thomas M. Galvin, 38 Gardiner Rd., Quincy, Mass. 02169

Filed Jun. 13, 1988, Ser. No. 205,928
Int. Cl.[5] G06F *15/22*
U.S. Cl. 364—401 15 Claims



8. A master system for visualizing and identifying gearing configurations and orientations, said master system comprising:

(a) mechanical display means for displaying an array of slide media contained therein;

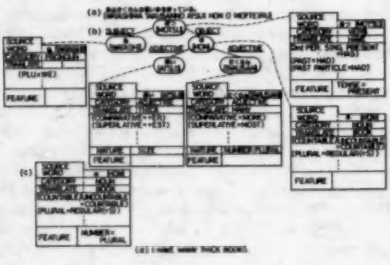
(b) each of said slide media including at least a pair of visual components relatively pivotal into a plurality of different angular relationships;

(c) at least one of said visual components presenting a selected gearing configuration, at least another of said visual components presenting a plurality of mechanical identifiers referring to said selected gearing configuration and to different orientations thereof.

4,964,044
MACHINE TRANSLATION SYSTEM INCLUDING SEMANTIC INFORMATION INDICATIVE OF PLURAL AND SINGULAR TERMS

Akira Kumano, Kamakura; Yumiko Sugiura, Yokohama, and Chiaki Aoyama, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 43,963, Apr. 29, 1987, abandoned. This application Sep. 22, 1989, Ser. No. 412,538
Claims priority, application Japan, May 20, 1986, 61-113716
Int. Cl.[5] G06F *15/38*
U.S. Cl. 364—419 8 Claims



1. A machine translation system for translating the Japanese language into another language including modifiers indicative of plural numbers of associated parts of speech, comprising:

(a) input means for inputting an original sentence in the Japanese language containing terms having no distinctions between the singular form and the plural form;

(b) dictionary means for storing information about the Japanese and the other language, inclusive of semantic information indicative of plural number;

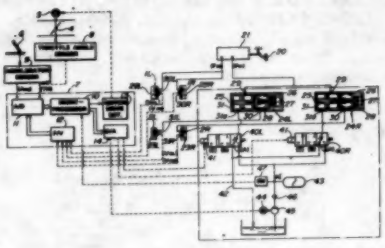
(c) translation means for syntactically and semantically translating the Japanese language into the other language having morphological distinctions between singular form and plural form on the basis of syntactic relationship between a first word category having a morphological distinction between the two forms and a second word category including semantic information indicative of plural number; and

(d) output means for outputting the other language.

4,964,045
TRACTION CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE

Toru Iwata; Shinji Katayose, and Minoru Tamura, all of Kanagawa, Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Apr. 6, 1989, Ser. No. 333,957
Claims priority, application Japan, Apr. 7, 1988, 63-84140
Int. Cl.[5] B60T *8/58*
U.S. Cl. 364—426.02 20 Claims



1. A traction control system for an automotive vehicle, comprising:

first engine controlling means associated with an automotive internal combustion engine, for adjusting an engine output;

second brake controlling means associated with a first driving wheel which is connected to said automotive internal combustion engine to be driven by said engine output and associated with a first brake circuit connected to a first wheel cylinder of said first driving wheel, for controlling braking force to be generated in said first wheel cylinder;

third brake controlling means associated with a second driving wheel which is connected to said automotive internal combustion engine to be driven by said engine output and associated with a second brake circuit connected to a second wheel cylinder of said second driving wheel, for controlling braking force to be generated in said second wheel cylinder;

first sensor means for monitoring wheel speed of said first driving wheel to produce a first driving wheel speed indicative signal;

second sensor means for monitoring wheel speed of said second driving wheel to produce a second driving wheel speed indicative signal;

third sensor means for monitoring vehicular body speed representative parameter for producing a vehicular body speed representative data;

first arithmetic means for deriving a wheel slippage at said first driving wheel on the basis of said first driving wheel spaced indicative signal and said vehicular body speed representative data for generating a first wheel slippage data;

second arithmetic means for deriving a wheel slippage at said second driving wheel on the basis of said second driving wheel speed indicative signal and said vehicular

body speed representative data for generating a second wheel slippage data;

third arithmetic means for deriving a weighted mean of said first and second wheel slippage data with a weighing coefficient which provides greater weight for one of said first and second wheel slippage data representing smaller wheel slippage than the other;

first control means, associated with said first engine controlling means, for controlling said engine output on the basis of said weighted mean; and

second control means, associated with said second brake controlling means, for controlling operation of said second brake control means for adjusting braking force to be generated in said first wheel cylinder on the basis of said first wheel slippage data; and

third control means, associated with said third brake controlling means and operative independently of said second control means, for controlling operation of said third brake controlling means, for adjusting braking force to be generated in said second wheel cylinder on the basis of said second wheel slippage data.

4,964,046

HARVARD ARCHITECTURE MICROPROCESSOR WITH ARITHMETIC OPERATIONS AND CONTROL TASKS FOR DATA TRANSFER HANDLED SIMULTANEOUSLY

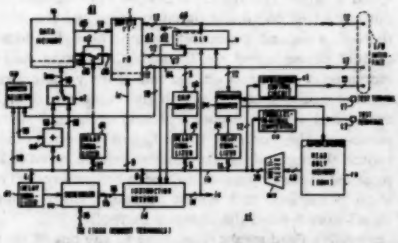
Soenke Mehrgardt, March, and Martin Winterer, Gundelfingen, both of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Continuation of Ser. No. 198,369, May 25, 1988, abandoned. This application Dec. 22, 1989, Ser. No. 453,027

Claims priority, application European Pat. Off., Jun. 2, 1987, 87107915.8; Dec. 17, 1987, 87118741.5

Int. Cl.[5] G06F *9/00*

U.S. Cl. 364—200 **3 Claims**



1. A digital data processor including an arithmetic logic unit ("ALU") that performs data processing operations, said ALU having first and second ALU inputs and an ALU output; a data memory having a data memory input and a data memory output; and a control unit connected to the data memory and the ALU by at least one data memory control bus and at least one ALU control bus, respectively, said digital data processor operating in synchronism with a clock signal to provide pipelined data processing operations sin response to pipelined instructions, said digital data processor comprising:

a buffer interposed between the ALU inputs and output and the data memory input and output to transfer data between said ALU and said data memory, said buffer controlled by said control unit via a buffer control bus;

a first bidirectional data link interconnecting the data memory input and output and the buffer, said first bidirectional data link comprising first and second unidirectional data buses on which data flows in opposite directions; and

a second bidirectional data link interconnecting said ALU inputs and output and said buffer, said second bidirectional data link comprising third and fourth unidirectional data buses on which data flows in the direction of the ALU inputs and a fifth unidirectional data bus on which data flows in the direction of the buffer from said ALU output;

wherein during one period of said clock signal, data transfers are performed over said first, second, third, fourth and fifth unidirectional data buses at the same time as said ALU performs said data processing operations, so that data transfers between the buffer and the ALU occur simultaneously with transfers between the buffer and the data memory;

wherein said buffer comprises address-selected memory cells which are switched through on any of the five unidirectional data buses and are read from or written into independent of each other;

wherein said control unit provides to the buffer over the buffer control bus decoded delayed branching instructions and conditional and unconditional skip instructions in a pipelined instruction sequence, said control unit comprising:

a control unit memory which holds an instruction list that is fetchable instruction word by instruction word, wherein an instruction word fetched during a period of said clock signal comprises all data-transfer instructions, control instructions, and ALU-operation instructions to be performed during an associated clock period, said instruction list being divided into segments, each said segment being executed without being interrupted by an interrupt, said instruction words being provided as outputs from said control-unit memory;

an instruction decoder that receives said instruction words from said control unit memory and provides said ALU-operation instructions to control said ALU, said instruction decoder further selectively providing task requests on a task request bus;

a set of task request terminals that receive a set of task requests from a device external to said control unit; and

a scheduler to delay jump instructions connected to said set of task request terminals and to said instruction decoder, said scheduler operating only at the end of one of said segments currently being executed in said instruction list to selectively initiate a jump to the beginning of a selectable different one of said segments in said instruction list in response to task request signals applied to it from said task request terminals or from said instruction decoder.

4,964,047

ANTI-SKID BRAKE CONTROL SYSTEM FOR AUTOMOTIVE BRAKE SYSTEM WITH PROJECTION OF VEHICULAR SPEED REPRESENTATIVE DATA ON THE BASIS OF LONGITUDINAL ACCELERATION EXERTED ON VEHICLE BODY

Toshiro Matsuda, Kanagawa, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Sep. 2, 1988, Ser. No. 239,807

Claims priority, application Japan, Sep. 4, 1987, 62-220457

Int. Cl.[5] B60T *8/32*

U.S. Cl. 364—426.02 **18 Claims**

1. An anti-skid brake control system for an automotive brake system comprising:

a hydraulic brake circuit comprising means for building up braking fluid pressure according to operational magnitude of a manually operable braking member and braking force generating means associated with a vehicular wheel for generating a braking force to decelerate said vehicular wheel;

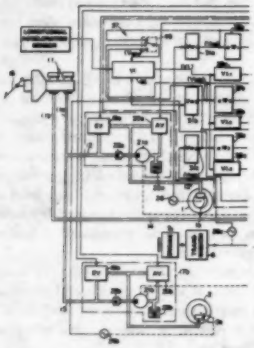
pressure adjusting means, disposed within said hydraulic circuit, for adjusting pressure of a working fluid to be delivered to said braking force generating means, said pressure adjusting means being operable at least in a first mode for increasing braking pressure in said braking force generating means and in a second mode for decreasing said braking pressure in said braking force generating means;

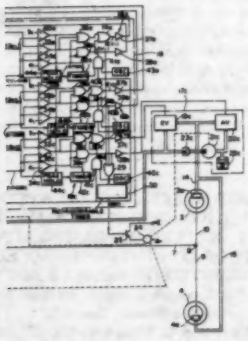
first sensor means for monitoring rotation speed of said vehicular wheel to produce a wheel speed indicative sensor signal value representative of rotation speed of said vehicular wheel;

second sensor means for monitoring longitudinal acceleration exerted on a vehicular body by producing a longitudinal acceleration indicative sensor signal value;

first means for detecting a predetermined vehicular braking condition satisfying a predetermined anti-skid brake control condition for initiating anti-skid control operation;

second means for latching a first wheel speed indicative value corresponding to said wheel speed indicative sensor signal value at a predetermined timing in each skid cycle





and for arithmetically deriving a vehicular deceleration indicative datum on the basis of said longitudinal acceleration indicative sensor signal value, and for driving a gradient of vehicular speed during vehicular deceleration on the basis of said longitudinal acceleration indicative sensor signal value;

third means for deriving a projected vehicular speed representative datum based on said first wheel speed indicative value and utilizing said gradient of vehicular speed; and

fourth means for controlling said pressure adjusting means between said first and second modes for maintaining said rotation speed of said vehicular wheel in a predetermined optimal relationship with said projected vehicular speed representative datum.

4,964,048

SYSTEM AND METHOD FOR AUTOMATICALLY CONTROLLING VEHICLE SPEED TO DESIRED CRUISE SPEED

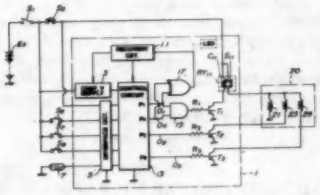
Hiroshi Tanaka; Yohsiyuki Etoh, and Yasuhisa Takeuchi, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Oct. 27, 1988, Ser. No. 263,387

Claims priority, application Japan, Oct. 30, 1987, 62-165384[U]; Oct. 30, 1987, 62-165385[U]

Int. Cl.[5] B60K *31/00*

U.S. Cl. 364—426.04 **18 Claims**



1. A method for automatically controlling a vehicle speed to a desired cruise speed, comprising the steps of:

(a) detecting a current vehicle speed;

(b) providing second means having a first command switch through which the current vehicle speed is set as a cruise speed at which the vehicle is desired to cruise and which outputs a first command signal to command the contents thereof, a second command switch through which the current cruise speed set through the second means is increased at a constant change rate of the vehicle speed to another cruise speed at which the vehicle is desired to cruise and which outputs a second command signal to command the contents thereof, and a third command switch through which the current vehicle speed is again returned to the original cruise speed before a system operation is released and which outputs a third command signal to command the contents thereof;

(c) providing third means responsive to any one of the first, second, and third command signals for outputting a control command signal through each of a plurality of output ports thereof according to the corresponding one of the first, second, and third command signals;

(d) providing fourth means having a plurality of control valves for, with a power supply therefor being received, adjusting an operating variable of a vehicular engine driving force adjusting mechanism according to the contents of the control command signals outputted from the third means via the respective output ports so that the current vehicle speed is controlled according to the corresponding one of the contents of the first, second, and third command signals;

(e) detecting at least one of conditions that none of the first, second, and third command signals is outputted from the corresponding first, second, and third command switches of the second means to the third means and that the third means erroneously outputs one of the control command signals indicating that the corresponding one of the control valves is energized; and

(f) disabling the power being supplied to the control valves when detecting at least one of the conditions in the step (e).

4,964,049

DIAGNOSIS SYSTEM FOR A MOTOR VEHICLE

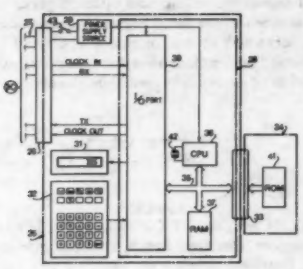
Kunihiro Abe, and Tomoya Kobayashi, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 278,797

Claims priority, application Japan, Dec. 11, 1987, 62-313436

Int. Cl.[5] G01M *15/00*; F02D *41/26*; F02P *17/00*

U.S. Cl. 364—431.01 5 Claims



1. A diagnosing system for diagnosing an automotive engine which is mounted on a motor vehicle and controlled by an electronic control system, the system having diagnosis means including a diagnosis device and a cartridge detachably connected to said diagnosis device, connecting means for transmitting signals between the electronic control system and the diagnosis device, a keyboard provided in said diagnosis device for inputting keyboard signals, and said diagnosis means being responsive to said keyboard signal for monitoring an operating condition of the engine, the diagnosing system comprising:

a first storing means provided in said cartridge for storing programs to diagnose the engine;

a second storing means in said cartridge for storing programs for providing a plurality of data formats representing a plurality of transmitting patterns for transmitting data between the electronic control system and the diagnosis device and for selecting one of the data formats;

select means responsive to respective of said keyboard signals for selecting a program corresponding to an input format; and

demand means responsive to said keyboard signals for transmitting a data demand signal to the electronic control system so as to apply data from the electronic control system to the diagnosis device through the selected data format.

4,964,050

METHOD OF CONTROLLING ELECTRICAL DEVICES OF INTERNAL COMBUSTION ENGINES

Masahiko Yakuwa, Wako; Kikuo Tomozawa, and Kazuya Kishi, both of Minato, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1988, Ser. No. 193,411

Claims priority, application Japan, Dec. 12, 1987, 62-115538; Dec. 12, 1987, 62-115540; Dec. 12, 1987, 62-115541

Int. Cl.[5] F02D *41/34*

U.S. Cl. 364—431.04 5 Claims

1. A method of controlling a plurality of electrical devices which control an operation of an internal combustion engine wherein a required operation period of time for which each of said electrical devices is to be operated is computed by computing means in response to operating conditions of the engine, the computed required operation period of time is counted by at least one time-counting means, and said each of said electrical devices is caused to operate while said time-counting means is operating, the method comprising the steps of:

(a) outputting an operation starting signal for starting a different one of said electrical devices from said computing means whenever counting by said time-counting means is started;

(b) generating an interrupt signal when the counting by said time-counting means is completed;

(c) outputting an operation ending signal for ending the operation of said different one of said electrical devices from said computing means in response to the generation of said interrupt signal;

(d) detecting whether another one of said electrical devices is operating, at the time of the outputting of said operation starting signal for said different one of said electrical devices at the step (a);

(e) reading an actual counted value in said time-counting means for said another one of said electrical devices, when said another one of said electrical devices is operating;

(f) determining the remainder of the computed required operation period of time for said another one of said electrical devices from the read actual counted value;

(g) calculating and storing a difference obtained by subtracting from the computed required operation period of time for said different one of said electrical devices the determined remainder of the computed operation period of time and a period of time twice as long as said predetermined period of time;

(h) setting the difference into said time-counting means when said interrupt signal is generated from said time-counting means at the step (b);

(i) restarting said time-counting means to count the set difference;

(j) generating an interrupt signal when the counting by said restarted time-counting means is completed; and

(k) outputting an operation ending signal for said different one of said electrical devices from said computing means when said predetermined period of time has elapsed after the generation of said interrupt signal at the step (j).

4,964,051

SYSTEM AND METHOD FOR ELECTRONIC CONTROL OF INTERNAL COMBUSTION ENGINE

Teruji Sekozawa, Kawasaki; Makoto Shioya, Tokyo; Motohisa Funabashi, Sagamihara, and Mikihiko Onari, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 27, 1987, Ser. No. 55,530

Int. Cl.[5] B60K *31/00*

U.S. Cl. 364—431.04 32 Claims

1. A system for electronically controlling an internal combustion engine for a vehicle comprising:

first detecting means for detecting an amount of depression of an accelerator pedal;

second detecting means for detecting an actual acceleration of the vehicle with respect to the road surface;

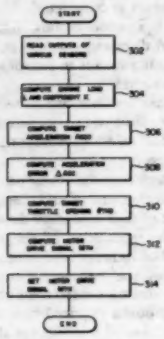
actuator means for controlling an amount of opening a throttle valve;

target acceleration setting means for setting respective values of target acceleration of the vehicle according to respective values of accelerator pedal depression detected by said first detecting means;

means for determining an error between the acceleration of the vehicle detected by said second detecting means and the target acceleration set by said target acceleration setting means; and

computing means for computing a target value of the open-

ing of the throttle valve on the basis of said acceleration error and for applying a signal representing the computed



target value of the throttle valve opening to said actuator means.

4,964,052

NAVIGATION DEVICE FOR USE IN A VEHICLE

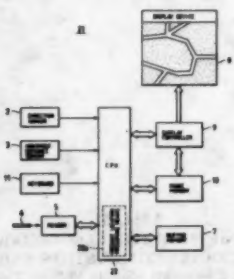
Hidemi Ohe, Osaka, Japan, assignor to NEC Home Electronics Ltd., Osaka, Japan

Filed Oct. 27, 1988, Ser. No. 263,359

Claims priority, application Japan, Oct. 30, 1987, 62-166571[U]; Oct. 30, 1987, 62-166572[U]

Int. Cl.[5] G06F *15/50*

U.S. Cl. 364—449 **7 Claims**



1. A navigation device mounted in a vehicle comprising:

means for detecting a direction of said vehicle;

means for detecting a movement distance of said vehicle;

means for recording map information, said map information representing intersections as nodes; and

control means for obtaining an updated presumed present location of said vehicle after said vehicle passes intersections, said control means comprising:

means for presuming presumed present location candidates using detected directions and movement distances, said presumed present location candidates including a presumed present location,

means for determining whether a plurality of presumed present location candidates exist that are within an allowable probability value after said vehicle passes first and subsequent intersections,

means for identifying each of said plurality of presumed present location candidates as provisional presumed present locations after said vehicle passes said first and subsequent intersections, and

means for establishing said updated presumed present location after passing one of said intersections comprising:

means for setting said updated presumed present location as the presumed present location candidate if the presumed present location candidate was never identified as one of said plurality of provisional presumed present locations, and

second means for setting said updated presumed present location as the presumed present location candidate that was identified as one of said plurality of provisional presumed present locations if another pretended present location of lesser error probability cannot be identified.

4,964,053

SELF-CHECKOUT OF PRODUCE ITEMS

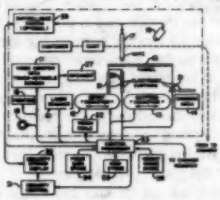
David R. Humble, Deerfield Beach, Fla., assignor to CheckRobot, Inc., Deerfield Beach, Fla.

Continuation of Ser. No. 185,167, Apr. 22, 1988, abandoned.

This application Oct. 11, 1989, Ser. No. 420,685

Int. Cl.[5] G06F *15/22*; G07C *11/00*

U.S. Cl. 364—466 **9 Claims**



1. An operator-unattended checkout system for processing articles selected for purchase and of first type bearing UPC indication and of second type not having UPC indication, said system comprising:

(a) reader means for generating output signals indicative of article UPC indication where present on articles;

(b) conveyor means for receiving articles and conveying them;

(c) scale means arranged operatively with said conveyor means for determining article weight and generating output signals indicative of determined article weight;

(d) customer-interactive display means for use in the computation of second type article price;

(e) processing means

(1) operable without customer input for using said scale means output signals and said reader means output signals for comparing the weight of the article read by said reader means with the weight indication provided by said scale means output signals and for generating first processing means output signals indicative of failure of such determination and second processing means output signals indicative of first type article price, and

(2) operable on customer input to said display means for using said customer input and said scale means output signals for generating third processor means output signals indicative of second type article price;

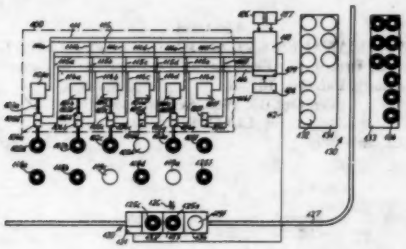
(f) control means responsive to said first processing means output signals for reversing the direction of movement of said conveyor means; and

(g) totalizing means for receiving said processor means second and third output signals for providing a totalized price for said articles selected for purchase.

4,964,054
METHOD FOR CHANGING SLIVER CANS AT A STATION OF A TEXTILE MACHINE

Hans Raasch, Moenchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Dec. 12, 1988, Ser. No. 283,154
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1987, 3742252
Int. Cl.[5] D01H *9/18*; G06F *13/02*
U.S. Cl. 364—470 14 Claims



1. A method for exchanging cans of sliver at a work station of a textile machine which handles sliver, the work station having sensing means for sensing the operating conditions thereat including the availability and feed of sliver and reporting the operating conditions to a data processing means, comprising:

interrogating the work station to determine the presence of an interruption in the sliver handling operation;

generating a signal to indicate if an interruption is present;

interrogating the work station concerning the availability of sliver and the proper feed of sliver;

generating a sliver signal if the work station reports, in response to said interrogating the work station concerning the availability of sliver and the proper feed of sliver, that no sliver is available or that the sliver feed is not proper, whereby an operation to exchange the sliver can from which the sliver was previously drawn for another can containing sliver can be initiated;

interrogating the work station, after said generating said sliver signal, to determine the operating status of the work station;

generating a follow-up signal in response to said interrogating the work station after said generating said sliver signal if the work station is again operating, whereby said follow-up signal can be interpreted as an indication that an exchange of an empty sliver can for a can containing sliver has occurred and;

determining the time elapsed since the sliver was first withdrawn from the replaced sliver can and increasing a count of empty sliver cans if said elapsed time exceeds a predetermined maximum operating time.

4,964,055
HAND-HELD POWER SYSTEM HARMONIC DISTORTION METER WITH SELECTIVE ACTIVATION OF DISPLAY

Wayne E. Grassel, Bethel Park, and Mark F. McGranaghan, McDonald, both of Pa., assignors to Cooper Industries, Inc., Houston, Tex.

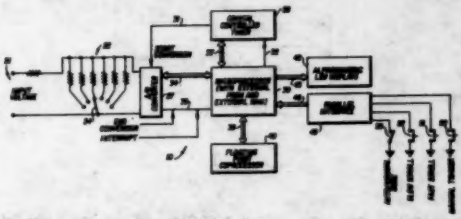
Filed Nov. 25, 1987, Ser. No. 125,548
Int. Cl.[5] G01R *23/16*
U.S. Cl. 364—485 5 Claims

1. A hand-held meter for measuring harmonic distortion of an AC power waveform, comprising CMOS memory means for sequentially collecting digital data constituting multi-bit representations of portions of said waveform; CMOS microprocessor means including calculating means responsive to the collection of a predetermined quantity of said digital data for performing intermediate calculations of the real and imaginary parts of the DC, fundamental frequency and harmonic components of said waveform; processing means for processing said intermediate calculations to obtain at least the magnitudes of the harmonic components of said waveform as a percentage of the fundamental frequency component of said waveform;

an alphanumeric display means for displaying said harmonic component magnitudes; and

switch means for selectively commanding said processing means to deliver the processed calculations to said alphanumeric display means for readout thereon.

3. A hand-held, battery-operated instrument for measuring harmonic distortion in power systems, comprising divider



means for reducing the magnitude of an AC input signal to be analyzed; analog-to-digital converter means for digitizing the reduced-magnitude signal into multi-bit sequences; processing means for subjecting the multi-bit sequences to fast Fourier transform processing with time decomposition and input bit reversal to provide output data indicative of the real and imaginary parts of the DC, fundamental frequency and harmonic components of the input signal; program means responsive to the output data for determining therefrom at least the magnitude of the harmonic components of said input signal as a percentage of the magnitude of the fundamental frequency thereof, and the total harmonic distortion of said input signal; display means for selectively displaying the parameters determined by the program means; and switch means for selecting the parameters to be displayed on said display means.

4,964,056
AUTOMATIC DESIGN SYSTEM OF LOGIC CIRCUIT

Keisuke Bekki; Takayoshi Yokota; Tooru Nagai, all of Hitachi, and Nobuhiro Hamada, Hitachiota, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 24, 1988, Ser. No. 173,251
Claims priority, application Japan, Mar. 25, 1987, 62-70702; Aug. 26, 1987, 62-210187; Sep. 29, 1987, 62-242454
Int. Cl.[5] G06F *15/60*
U.S. Cl. 364—488 8 Claims

1. An automatic design system of a logic circuit for generating control signals of a circuit system including a plurality of function circuit modules comprising:

first store means for storing control information formats for the circuit system by use of bit patterns;

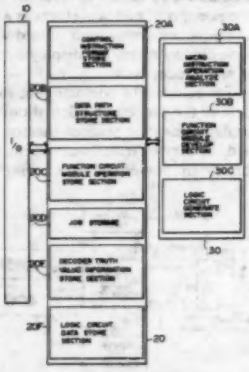
second store means for storing information about a constitution of each said function circuit module constituting the circuit system;

third store means for storing information related to a function of each said function circuit module constituting the circuit system in a form of second operation information corresponding to a bit pattern of a control signal of the circuit system;

means for analyzing, based on the control instruction formats of said first store means and information of said second store means, an operation of each said function circuit module so as to represent the operation of said each function circuit module by use of a first operation information;

means for extracting, by referencing said first operation

information and said second operation information, bit patterns for which matching is found with respect to operation contents so as to generate truth value informa-



tion of said logic circuit according to the extracted bit patterns; and

means for generating control signals of said circuit system from said truth value information.

4,964,057

BLOCK PLACEMENT METHOD

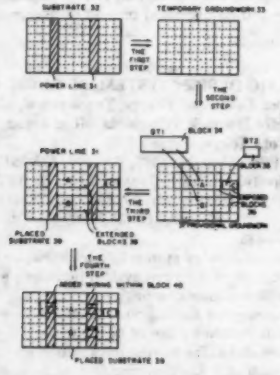
Shoji Yabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 117,995, Nov. 9, 1987, abandoned. This application Jul. 27, 1989, Ser. No. 386,002

Claims priority, application Japan, Nov. 10, 1986, 61-265479

Int. Cl.[5] G06F *15/60*

U.S. Cl. 364—491 **2 Claims**



1. A block placement method for automatically placing a plurality of blocks on a substrate, wherein the method includes the steps of:

a temporary groundwork design step for designing a temporary groundwork design which does not contain a block placement inhibited area but has an identifiable location for said area;

a provisional groundwork design step for initially placing said blocks upon said temporary groundwork design designed by said temporary groundwork design step and subsequently improving the initial block placement, at least one block being placed over said identifiable location;

a placed substrate design step for inserting, at said identifiable location, said block placement inhibited area into the provisional groundwork design designed by said provisional groundwork design step so as to obtain an extended block having separated portions; and

a routing design step for routing wiring within said extended block, between said separated portions, on a substrate designed by said placed substrate design step.

4,964,058

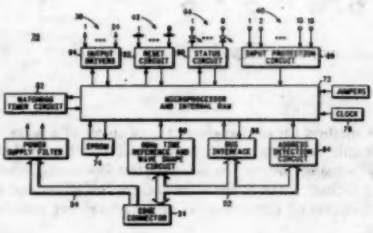
POWER MANAGEMENT AND AUTOMATION SYSTEM

Robert J. Brown, Jr., Boca Raton, Fla., assignor to Square D Company, Palatine, Ill.

Filed Oct. 13, 1988, Ser. No. 257,076

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—492 **21 Claims**



1. A power management and automation system for controlling power to a plurality of appliances in a facility, comprising:

a circuit breaker arrangement, responsive to a circuit breaker control signal, through which power is provided to at least a first one of the plurality of appliances;

a power switching circuit, responsive to an appliance control signal, for switching power to at least a second one of the plurality of appliances at its point of use;

a programmable controller for generating commands to indicate when power to the respective ones of the plurality of appliances should be provided;

a circuit breaker control module, responsive to the programmable controller, for generating the circuit breaker control signal; and

a point of use control module including

processing means, responsive to the programmable controller, for generating the appliance control signal for the power switching circuit, and

manually operable switch means for providing an override power switching function which allows a user to control the power switching circuit independently of the programmable controller.

4,964,059

APPARATUS FOR INSPECTING A PIPELINE

Nobuyasu Sugaya; Munetaka Kondo; Kikuji Murashita, and Motoi Kobayashi, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Aug. 15, 1988, Ser. No. 232,494

Claims priority, application Japan, Aug. 21, 1987, 62-207981

Int. Cl.[5] G01N *29/10*

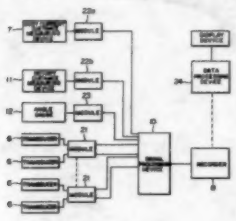
U.S. Cl. 364—507 **11 Claims**

11. An apparatus for inspecting a pipeline having a pig body which measures an inner shape and a wall thickness of a pipe body, traveling inside the pipe body, comprising:

at least two distance measuring devices for measuring a traveling distance of the pig body, including at least a rotary distance measuring device and an eddy current distance measuring device;

a rotation angle gauge for measuring a rotation angle of the pig body around its center axis;

a plurality of transducer for transmitting and receiving ultrasonic beams being arranged in the circumferential direction of the pig body and being confronted with an inner surface of the pipe body, for measuring the inner shape and the wall thickness of the pipe body;



a recorder associated with the pig body which stores measured data;

a signal processing device for processing signals from the distance measuring devices, the rotation angle gauge and the

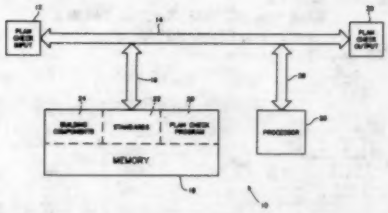
a data processing device for analyzing the measured data stored in said recorder after the pig body has been taken out of the pipe body.

4,964,060

COMPUTER AIDED BUILDING PLAN REVIEW SYSTEM AND PROCESS

Charles H. Hartsog, 730 Moreno Ave., Palo Alto, Calif. 94303

Filed Dec. 4, 1985, Ser. No. 805,361
Int. Cl.[5] G06F *15/60*
U.S. Cl. 364—512 17 Claims



1. A process for checking a development plan configuration against predetermined development plan configuration standards, which comprises: providing the development plan configuration to be checked as an input to a data processing system as data in a form representing at least one physical characteristic of building components in the development plan and intelligible to the data processing system; storing the development plan data in a path through a tree structure; storing the development plan configuration standards against which the development plan configuration is to be checked in the data processing system as data in a form representing at least one physical characteristic of building components in the development plan configuration standards and intelligible to the data processing system; providing a control program for evaluating the at least one physical characteristic of the building components in the development plan configuration data according to the at least one physical characteristic of the building components in the development plan standards configuration data to the data processing system; evaluating the at least one physical characteristic of the building components in the development plan configuration data according to the at least one physical characteristic of the building components in the development plan standards configuration data to determine compliance of the development plan configuration with the development plan configuration standards using the control program in the data processing system; and providing development plan configuration standards compliance results of the evaluation as an output from the data processing system.

14. A process for checking a development plan configuration against predetermined development plan configuration standards, which comprises: providing the development plan configuration to be checked as an input to a data processing system as data in a form representing at least one physical characteristic of building components in the development plan and intelligible to the data processing system; storing the development plan configuration standards against which the development plan configuration is to be checked in the data processing system as data in a form representing at least one physical characteristic of building components in the development plan configuration standards and intelligible to the data processing system; providing a control program for evaluating the at least one physical characteristic of the building components in the development plan configuration data according to the at least one physical characteristic of the building components in the development plan standards configuration data to the data processing system; evaluating the at least one physical characteristic of the building components in the development plan configuration data according to the at least one physical characteristic of the building components in the development plan standards configuration data to determine compliance of the development plan configuration with the development plan configuration standards using the control program in the data processing system; tracing usage of subroutines in determining compliance of the development plan configuration with the standards, comparing the traced subroutine usage against a specification of subroutine usage to determine if data entered with the development plan configuration is valid and providing development plan configuration standards compliance results of the evaluation as an output from the data processing system.

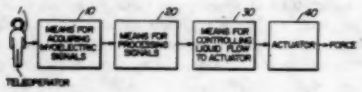
17. A process for checking a development plan configuration against predetermined development plan configuration standards, which comprises: providing the development plan configuration to be checked as an input to a data processing system as data in a form representing at least one physical characteristic of building components in the development plan and intelligible to the data processing system; providing the development plan configuration standards against which the development plan configuration is checked in the form of artificial intelligence structures, including rules, frames and nets; storing the development plan configuration standarde against which the development plan configuration is to be checked in the data processing system as data in a form representing at least one physical characteristic of building components in the development plan configuration standards and intelligible to the data processing system; providing a control program for evaluating the at least one physical characteristic of the building components in the development plan configuration data according to the at least one physical characteristic of the building components in the development plan standards configuration data to the data processing systems; evaluating the at least one physical characteristic of the building components in the development plan configuration data according to the at least one physical characteristic of the building components in the development plan standards configuration data to determine compliance of the development plan configuration with the development plan configuration standards using the control program in the data processing system; and providing development plan configuration standards compliance results of the evaluation as an output from the data processing system.

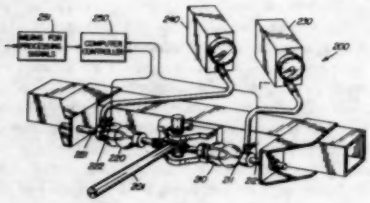
4,964,061

MYOELECTRIC CONTROL OF ACTUATORS

Juliusz J. Grodski, Toronto; Guy B. Immega, and Peter D. Lawrence, both of Vancouver, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ontario, Canada

Filed Jul. 5, 1989, Ser. No. 375,453
Claims priority, application Canada, Jul. 11, 1988, 571707
Int. Cl.[5] A61F *1/06*
U.S. Cl. 364—513 **7 Claims**





4. A compliance control system for a teleoperated robotics system, comprising:

electrodes means for acquiring a myoelectric signal from a teleoperator;

first and second signal processing means for processing said myoelectric signals received from said electrodes means into compliance control signals; and

first and second servovalves having an input from said first and second signal processing means respectively for controlling fluid flow supplied to first and second actuators respectively;

said actuators having an output relative to said fluid flow supplied by said first and second servovalves.

4,964,062

ROBOTIC ARM SYSTEMS

Shivadev K. Ubhayakar, 28325 Hazelridge Dr., Rancho Palos Verdes, Calif. 90274, and Robert D. Baker, 28105 Golden Meadow Dr., Rancho Palos Verdes, Calif. 90472

Filed Feb. 16, 1988, Ser. No. 156,388
Int. Cl.[5] B25J *17/00, 18/00*
U.S. Cl. 364—513 **22 Claims**

1. A manipulator comprising:

a robotic arm, said arm comprising:

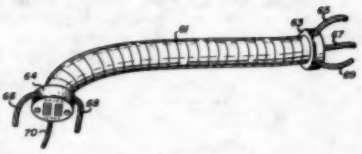
(a) at least two ends; and

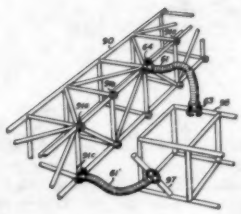
(b) an arm actuator means for positioning the ends in a plurality of positions relative to each other;

each end comprising a plurality of fingers forming a hand; each finger comprising:

(a) a base end;

(b) a free end; and





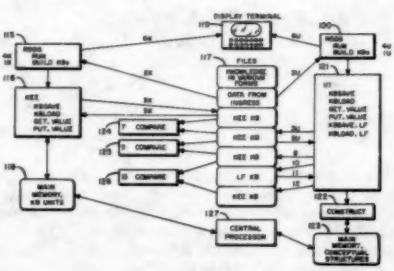
(c) a finger actuator means for positioning the free end relative to the base end.

4,964,063

SYSTEM AND METHOD FOR FRAME AND UNIT-LIKE SYMBOLIC ACCESS TO KNOWLEDGE REPRESENTED BY CONCEPTUAL STRUCTURES

John W. Esch, Burnsville, Minn., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Sep. 15, 1988, Ser. No. 244,365
Int. Cl.[5] G06F *15/18*
U.S. Cl. 364—513 **5 Claims**



1. A method of operating a data processing system having memory means and processor means coupled to said memory means comprising,

storing concept data, relation data, calculation function code bits, knowledge representation function code bits and symbolic access code bits in said memory means,

utilizing said processor means to access symbolic access code bits in order to acquire knowledge representation frame code bits that are related to said accessed symbolic access code bits, wherein said knowledge representation frame code bits represent storage addresses of said memory means for related concept data, relation data and calculation function code bits, and

employing said processor means so that said processor means utilizes said acquired knowledge representation frame code bits to obtain said related concept data, relation data and calculation function code bits from said memory means.

4,964,064

METHOD AND APPARATUS FOR CONSTRAINT-ORIENTED INFERENCE

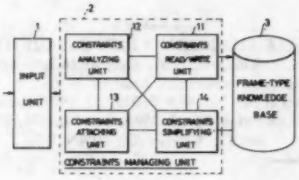
Hideyuki Tsutsumitake; Tetsuro Muranaga, both of Yokohama, Japan, and Takashi Moriyasu, Edinburgh, United Kingdom, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 15, 1988, Ser. No. 244,899

Claims priority, application Japan, Sep. 26, 1987, 62-241361

Int. Cl.[5] G09C *15/00;* **G10C** *15/00;* **G06F** *15/24;* **G09B** *7/12*

U.S. Cl. 364—513 **10 Claims**



1. An apparatus for constraint-oriented inference, the apparatus comprising:

knowledge base means containing frames comprised of slots and slot values for storing knowledge concerning objects of interest, each object being represented by one of the frames, categorized attributes being represented by slots in a frame, a particular attribute value corresponding to an object being represented by slot values in a frame, and constraints indicating relationships among slot values of the frames, the constraints stored collectively in a part of the knowledge base means; and

constraints managing means for selecting frames and slots relevant to each constraint and for attaching a pointer to each of the selected slots to make a constraint accessible by the slots.

4,964,065

COMPUTER-CONTROLLED ELECTRONIC SYSTEM MONITOR

John R. Hicks, Lone Oak, and Peter Mailandt, Dallas, both of Tex., assignors to Decibel Products, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 25,216, Mar. 12, 1987, Pat. No. 4,823,280. This application Sep. 9, 1988, Ser. No. 243,326

The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.

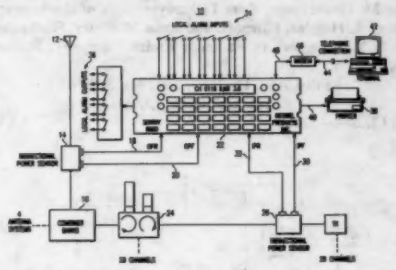
Int. Cl.[5] G06K *15/00;* **G01R** *19/00*

U.S. Cl. 364—514 **13 Claims**

1. An electronic monitoring apparatus for monitoring a communications system having a transmitter and an antenna comprising:

sensor means for connection between the transmitter and antenna for producing selected power measurements;

a programmable controller connected to the sensor means, said programmable controller including first means operatively connected to the sensor means for continuously monitoring the power measurements, comparator means for comparing the power measurements with preselected tolerable upper and lower power limits and second means connected to the comparator means for generating digitized information signals indicative of a need for maintenance operations prior to failure of the communications system; and



communication means connected to the programmable controller for automatically communicating the digitized information signals over a communication media.

4,964,066

DEVICE FOR EDITING AND DISPLAYING DATA RECORDED ON SPECIALIZED SHEETS OR RECORDS

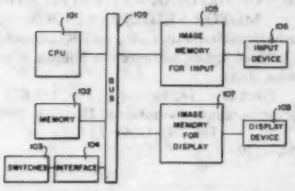
Yasukuni Yamane; Noritoshi Kako; Yoji Noguchi, all of Nara, and Masaki Takakura, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 338,553, Apr. 13, 1989, abandoned, which is a continuation of Ser. No. 92,420, Sep. 3, 1987, abandoned. This application Feb. 22, 1990, Ser. No. 484,465

Claims priority, application Japan, Sep. 5, 1986, 61-210116; Sep. 5, 1986, 61-210117; Sep. 5, 1986, 61-210118; Sep. 5, 1986, 61-210119

Int. Cl.[5] G06F *15/66;* **G09G** *5/36;* **G06K** *9/00*

U.S. Cl. 364—518 **9 Claims**



5. A device for editing and displaying an image including an image editing device and an image display device, said image editing device comprising

a data creating means for creating data of a code array obtained by selectively arranging in the order of execution those of a plurality of simplified figure codes corresponding to figure elements and a plurality of simplified process codes for specifying processing of said figure codes, and

and exchangeable non-volatile external memory means for recording said data created by said data creating means,

and said image display device comprising

data reading means for retrieving data recorded in said non-volatile external memory means,

data processing means for creating image data of a display image composed of picture elements by interpreting codes in data retrieved by said data reading means and executing said according to said code array,

image memory means for recording the value of each of said picture elements of said display image, and

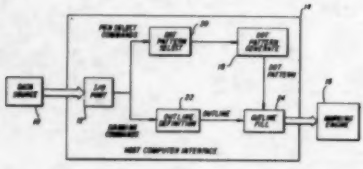
display means for displaying image data recorded in said image memory means in the form of an image.

4,964,067

COMPUTER OUTPUT PRINTER WITH PLOTTER EMULATION

Aline M. Honickman; John L. Steeves, both of Rochester; Michael A. Higgins, Fairport, and Anna M. Frary, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 11, 1989, Ser. No. 338,665
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—520 **4 Claims**



1. In a computer output printer of the type having a host computer interface capable of emulating a plurality of other manufacturers printers, the improvement comprising:

the host computer interface emulating a color pen plotter having a plurality of plotter pens, including,

(a) means for generating a plurality of halftone dot patterns, each dot pattern corresponding to a different plotter pen;

(b) means for interpreting pen selection commands to select a corresponding halftone dot pattern;

(c) means for interpreting a plotting command to define an outline of the line to be plotted; and

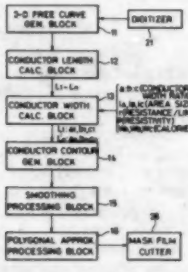
(d) means for filling the outline of the line with the outline dot pattern corresponding to the selected pen.

4,964,068

APPARATUS FOR DRAWING A CONDUCTOR PRINT PATTERN OF DEFOGGING HEATER WIRES ON A MOTOR VEHICLE WINDOW

Yoshimitsu Matsushita, Kawasaki, and Katsuyoshi Ohme, Yokohama, both of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Dec. 14, 1989, Ser. No. 450,675
Claims priority, application Japan, Dec. 20, 1988, 63-321169
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—520 **13 Claims**



1. An apparatus for drawing a conductor print pattern of defogging heater wires to be printed on a window glass of a motor vehicle comprising:

digitizing means for obtaining coodinate values of points on a model line of the defogging heater wires;

function generation means for developing wire-functions of said heater wires on the basis of said coodinate values of said model line;

length calculation means for calculating length along each wire between both ends thereof;

width calculation means for calculating conductor width of each wire within respective heating areas comprising a high-heating area at a central portion of the window glass and a peripheral low-heating area, in accordance with input data consisting of:

resistances of heater wires;

lengths of respective heater wires;

lateral widths of respective heating areas;

calorific values of the respective areas;

resistivity of conductor material; and

thicknesses of conductors in respective heating areas;

contour generation means for generating contours of the heater wires, on the basis of data consisting of said wire-functions and said conductor widths; and

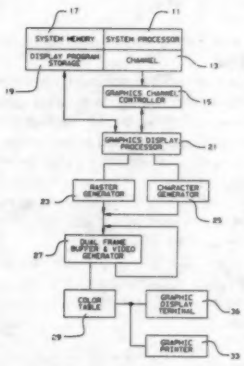
means for drawing the print pattern of the heater wires on the basis of the conductor contours.

4,964,069

SELF ADJUSTING VIDEO INTERFACE

Joseph C. Ely, Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 48,870, May 12, 1987, abandoned. This application Apr. 6, 1989, Ser. No. 334,787
Int. Cl.[5] G09G *1/00*; H04N *5/04*
U.S. Cl. 364—521 **6 Claims**



1. A system for automatic adjustment of a video interface during installation of relocation of said interface, said adjustment being with respect to the reference timing of a system processor to which said video interface is connected, said system comprising:

means in said system processor for generating reference timing signals,

means in said system processor for generating a data signal to said video interface, said data signal being delayed a specified system processor delay from a reference timing signal generated by said means for generating,

said video interface having a timing clock for timing the display of a plurality of pixels on a display device connected to said video interface, and

said video interface further comprising means for synchronizing said interface timing clock with a reference signal from said means for generating reference timing signals,

said synchronizing means comprising:

means for determining a variation between the specified system processor delay and the unadjusted video interface delay from said reference signal to the center of said data signal as measured by said video interface, and

means for adjusting said video interface delay by the amount of said variation to establish an adjusted video interface

delay such that said plurality of pixels are correctly displayed on said display device.

4,964,070

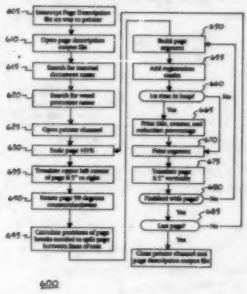
METHOD FOR PREPARING CAMERA-READY PHOTOSTATIC COPIES PRINTED BY RASTER PRINTERS FOR USE IN THE PUBLISHING INDUSTRY

Jay Markoff, San Diego, and John R. Deubert, La Jolla, both of Calif., assignors to Vital LaserType, Inc., San Diego, Calif.

Filed May 5, 1988, Ser. No. 190,348

Int. Cl.[5] G06F *3/12*

U.S. Cl. 364—523 **2 Claims**



600

1. A method for increasing the optical fidelity of the characters printed on a plurality of pages by a raster printer which is coupled to a data processing system which pages are assembled together and photo-reduced, the method comprising the steps, executed with the aid of said data processing system, of

obtaining from said data processing system a representation of said page including its width and length dimensions to be sent to said raster printer;

expanding said width and length dimensions of said page by a predetermined scale factor;

rotating said expanded page 90 degrees;

dividing said expanded and rotated page into a first number of subpages, said first number being determined according to said scale factor; and

printing each one of said first number of subpages onto separate sheets for later assembly;

translating the upper-left hand corner of the expanded page representation to the right by an amount corresponding to the width of said sheets of paper; and

rotating said translated page 90 degrees to allow display of said enlarged text across the length of said enlarged page;

printing registration marks onto said sheets;

assembling said subpage by aligning said registration marks; and

photo-reducing said assembled subpages onto a photographic plate or stat.

4,964,071

METHODS AND APPARATUS FOR MEASURING TRANSVERSE DIMENSIONS OF WORKPIECES

Roger I. Grosvenor, Cardiff, Wales, assignor to National Research Development Corporation, London, England

Filed Nov. 28, 1988, Ser. No. 276,657

Claims priority, application United Kingdom, Nov. 30, 1987, 8728016

Int. Cl.[5] G06F *15/46*

U.S. Cl. 364—560 **29 Claims**

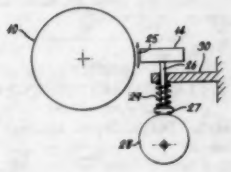
1. A method of deriving a dimension of an object transverse to an axis of the object and at least partly defined by a surface of the object, the method comprising the steps of:

moving a non-contacting distance-measuring sensor along a predetermined path while repeatedly measuring a distance between said surface and the sensor, said path being substantially within a predetermined plane orthogonal to a line which intersects said axis orthogonally and the path being, at least at times, at an angle to a line in said plane which is parallel to said axis,

analyzing, using a predetermined analytical method, a relationship between distances measured and a position of the sensor in the path, and

deriving an indication of said dimension from the analyzing and from a previous calibration relating analysis carried out by the predetermined analytical method to a known dimension normal to said plane for sensor movement along said path.

15. An apparatus for deriving a dimension of an object transverse to an axis of the object and at least partly defined by the surface of the object, comprising:



means for mounting an object with an axis thereof transverse to a dimension to be measured in a predetermined position,

a non-contacting sensor for measuring a distance between the sensor and a surface of the object which at least partly defines said dimension,

means arranged to move the sensor along a predetermined path while repeatedly measuring the distance between said surface and the sensor, said path being substantially within a predetermined plane orthogonal to a line which intersects said axis orthogonally and said path being, at least at times at an angle to a line in said plane which is parallel to said axis, and

means for analyzing, using a predetermined analytical method, a relationship between distances measured by the sensor and a position of the sensor in the path and for deriving an indication of said dimension from said analyzing.

4,964,072

ELECTRONIC DEVICE WITH CALENDAR FUNCTION

Seietsu Nara, and Toshiyuki Kawagishi, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 1, 1988, Ser. No. 239,220

Claims priority, application Japan, Sep. 10, 1987, 62-227322; Nov. 12, 1987, 62-285919

Int. Cl.[5] G06F *15/16*

U.S. Cl. 364—705.08 **8 Claims**

1. An electronic device having memory means for storing calendar data, said device comprising:

power source means for supplying electrical power to said electronic device;

a contact portion for connecting said electronic device to an external device;

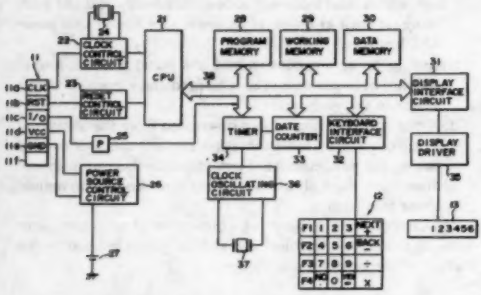
clock signal generating means for generating a clock signal;

timer means for generating time data in response to the clock signal generated from said clock signal generating means;

date counter means for counting the time data generated from said timer means and for producing a count data; and

central processing unit means for updating the calendar data

stored in said memory means based on the count data from said date counter means, in response to a power source



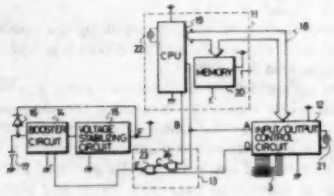
voltage being supplied from the external device via said contact portion.

4,964,073

PORTABLE DATA COLLECTING AND PROCESSING APPARATUS

Hiroyuki Watanabe, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Filed Feb. 1, 1989, Ser. No. 305,369
Claims priority, application Japan, Feb. 12, 1988, 63-31448
Int. Cl.[5] G06F *1/00*
U.S. Cl. 364—707 **3 Claims**



1. A portable data collecting and processing apparatus having at least one battery therein, comprising:

keyboard means for selectively entering data and commands into the apparatus, said keyboard means having a plurality of keys;

input control means coupled with said keyboard means for coding the data and commands entered into said keyboard means and outputting a signal corresponding to the coded data or commands and a start signal;

information processing means coupled with said input control means for processing the signal provided by said input control means and outputting a processed signal, said information processing means having an operation mode and a stop mode and outputting an operation signal during the operation mode;

display means coupled to said information processing means for displaying information corresponding to the processed signal from said information processing means;

voltage control means coupled with said input control means and said information processing means, said voltage control means receiving said start signal from said input control means and said operation signal from said information processing means, and outputting a booster control signal; and

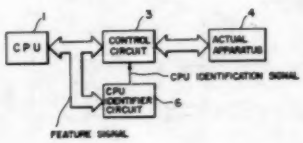
power supply means including a booster circuit for boosting a voltage of said at least one battery, said power supply means being coupled with said voltage control means and said battery for selecting either a voltage obtained by boosting the battery voltage or said battery voltage in accordance with said booster control signal from said voltage control means and supplying the selected voltage to said input control means, said information processing means, and said voltage control means.

4,964,074

IN-CIRCUIT EMULATOR

Noriyuki Suzuki, and Hironobu Asai, both of Tokyo, Japan, assignors to Ando Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 30,201, Mar. 24, 1987, abandoned. This application Feb. 2, 1989, Ser. No. 306,252
Claims priority, application Japan, Mar. 31, 1986, 61-73648
Int. Cl.[5] G06F *9/455, 13/00*
U.S. Cl. 364—900 **4 Claims**



1. An in-circuit emulator comprising:

(a) a selected CPU which is one of a plurality of CPUs (microprocessors) of different types, portions of constituent elements thereof being different from each other and producing a feature signal which includes a control signal output by each said CPU as an inherent part of normal operation thereof and which is different for each said CPU;

(b) a control circuit which controls emulation of said selected CPU, which is connected to said selected CPU and to an external actual apparatus having a circuit portion which is controlled by said feature signal, and which has a plurality of different emulation modes which each correspond to a respective said CPU; and

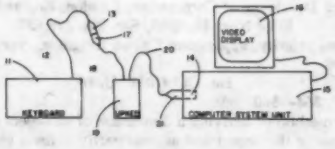
(c) identifier circuit means connected to said selected CPU and to said control circuit for identifying said selected CPU based upon said feature signal therefrom and for then producing an output signal which corresponds to said selected CPU, said control circuit having means for automatically switching it to a respective said emulation mode corresponding to said selected CPU in response to said output from said identifier circuit means.

4,964,075

SOFTWARE AND HARDWARE INDEPENDENT AUXILIARY USER PROGRAMMABLE INTELLIGENT KEYBOARD

Paul J. Shaver, Scotia; Patrick Madden, Smithtown, and Allan Michasiow, Troy, all of N.Y., assignors to A. J. Weiner, Inc., Randolph, Mass.

Continuation of Ser. No. 47,695, May 8, 1987, abandoned. This application Oct. 6, 1989, Ser. No. 420,608
Int. Cl.[5] G06F *3/02*; G06C *7/02*
U.S. Cl. 364—900 **6 Claims**



1. A portable and user-programable data storage and transfer device, for insertion and usage in-line between a computer data

input subsystem and a computer processor system unit comprising:

microcontroller processing means for controlling said device, said processing means coupled to non-volatile memory means and interface circuitry;

the interface circuitry for coupling and decoupling said device to and from a computer keyboard in order to input data from said keyboard to said microcontroller processing means and also for sending data from said microcontroller processing means to the computer processor system unit while allowing unimpeded communication back and forth between said keyboard and the computer system unit;

non-volatile, user-alterable memory means for storing said data acquired from said keyboard,

keying means independent of said keyboard and independent of said computer processor system unit, said keying means coupled to said microcontroller processing means and responsive to user selection and operation in order to store specific data acquired from said computer keyboard in said non-volatile memory means, to associate said stored data with a MACRO identifying label affixed to or near each key and to enable the user to command microcontroller processing means to output stored data from said non-volatile memory means to a portion of said interface circuitry for transmission to said computer processor system unit whenever the user operates said keying means.

4,964,076

SYSTEM FOR CONTROLLING DATA BUS COMMUNICATIONS OF A DATA BUS FOR VEHICLES

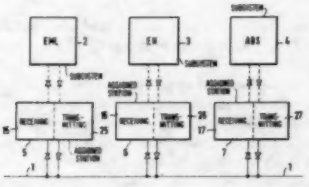
Hans-Eberhard Schurk, Markt Indersdorf, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Continuation of Ser. No. 911,759, Sep. 26, 1986, abandoned. This application May 5, 1989, Ser. No. 351,274

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1985, 3534216

Int. Cl.[5] G06F *13/36*; H04J *3/02*

U.S. Cl. 364—900 **30 Claims**



1. A system controlling communications for a data bus used in vehicles, in which several users communicate with one another via a common data bus, comprising:

individual station means for connecting each of said users to said common data bus, for receiving and transmitting continuously variable lengths of data on said common data bus,

receiving registers at each of said individual station means for storing data received and identified as required by a corresponding user of said individual station means,

transmitting registers at each of said individual station means for storing and providing an identification tag for each datum of said continuously variable lengths of data as furnished form said corresponding user of said individual station means, a length of said continuously variable lengths of data being a function of a renewal rate specific to each datum of data furnished from said corresponding user and a frequency of transmission of data from each of said transmitting registers to said common data bus,

receiving means at each of said stations, constantly connected to said common data bus, for receiving and identifying said data required by said corresponding user of said station means based on said identification tag of each datum of data on said common data bus, and

transmission means at each of said individual station means for transmitting sequentially the continuously variable lengths of data stored by an associated transmitting register, each of said transmission means being connected to said common data bus for a continuously variable time interval equaling the length of time for transmission of each datum currently stored by said transmitting register.

4,964,077

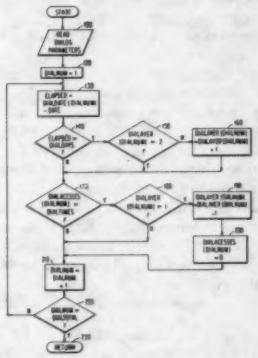
METHOD FOR AUTOMATICALLY ADJUSTING HELP INFORMATION DISPLAYED IN AN ONLINE INTERACTIVE SYSTEM

Ivan R. Eisen, Flower Mound, and Ruth A. Morris, Dallas, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1987, Ser. No. 104,922

Int. Cl.[5] G06F *3/14*

U.S. Cl. 364—900 **7 Claims**



1. In a data processing application having a plurality of functional components and comprising a plurality of displays at least some of which include prompts for user input, a storage and a data structure, a method of presenting a different level of help/dialog for each said functional component to different users during execution of said data processing application comprising the computer performed steps of:

storing on said storage a plurality of levels of help/dialog for each said functional component for which there is a display including prompts for user input, said levels ranging from more detailed for users with minimal experience with said data processing application to less detailed or different information for users with greater experience with said data processing application;

maintaining a record in said data structure on said storage of a number of times each said functional component has been accessed by each user;

detecting which one of said functional components is active based on what display is operative;

determining which one of said levels of the dialog for said operative display including prompts for user input should be displayed based on the number of times said user has accessed said functional component and which one of said levels of help should be displayed in response to a user request for help based on the number of times said user has accessed said functional component; and

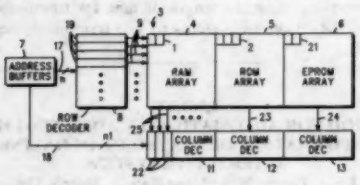
activating a display of the help/dialog for said operative display.

4,964,078

COMBINED MULTIPLE MEMORIES

Jaswinder S. Jandu, and Trevor S. Smith, both of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 16, 1989, Ser. No. 352,302
Int. Cl.[5] G11C 5/06
U.S. Cl. 365—51 12 Claims



1. A monolithically integrated memory system, comprising:

first means coupled for receiving an address and having a plurality of outputs for providing a plurality of digital words wherein only one of said plurality of outputs is active at any given time;

second means having a plurality of cells for storing digital information and coupled for receiving at least one of said plurality of digital words provided at said plurality of outputs of said first means, each of said plurality of cells having an x and a y pitch; and

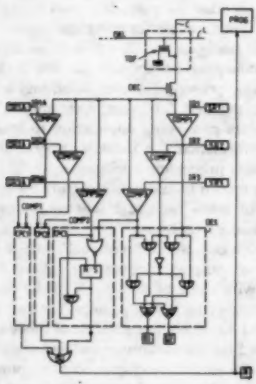
third means coupled to said first means and having a plurality of cells for storing digital information in a manner different from said second means, said third means being spaced and aligned with respect to said second means, each of said plurality of cells having an x and a y pitch, wherein the x pitch is different than the x pitch of said plurality of cells of said second means while the y pitch of said plurality of cells of said second and third means are substantially equal.

4,964,079

ELECTRICALLY PROGRAMMABLE MEMORY WITH SEVERAL INFORMATION BITS PER CELL

Jean Devin, AIX En Provence, France, assignor to SGS-Thomson Microelectronics, Gentilly, France

Filed Apr. 24, 1989, Ser. No. 342,476
Claims priority, application France, Apr. 26, 1988, 88 05511
Int. Cl.[5] G11C 11/56, 11/34
U.S. Cl. 365—168 3 Claims



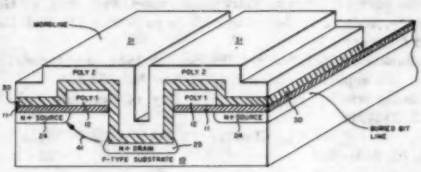
1. An electrically programable memory, wherein the reading of the information stored is done, in reading mode, by comparison between, a current or a voltage which is a function of the programmed state of the cell and, a reference value, said memory comprising several comparison circuits, working in reading mode, to compare the current or the voltage with n-1 main reference values of a sequence and to deduce therefrom the programmed state of the cell from among n possible states, where n is at least equal to 3, said memory also comprising several comparison circuits to compare the current or the voltage of the cell with intermediate reference values, each intermediate reference value being located between a first main reference value and a second main reference value which are consecutive values of the sequence, the memory further comprising a logic control circuit receiving the outputs of the comparison circuits to control the execution of an operation for complementary programming of the cell if the current or the voltage is between a main reference value and the intermediate reference value that follows it, and to stop this complementary programming when the current or voltage measured reaches a determined threshold between the intermediate value and the second main value.

4,964,080

THREE-DIMENSIONAL MEMORY CELL WITH INTEGRAL SELECT TRANSISTOR

Jyh-Cherng J. Tzeng, Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Mar. 9, 1990, Ser. No. 491,226
Int. Cl.[5] G11C 11/40
U.S. Cl. 365—185 16 Claims



1. An electrically programmable and electrically erasable memory cell formed in a silicon substrate of a first conductivity type comprising:

first and second spaced-apart regions of a second conductivity type formed in said substrate defining a channel therebetween, said second region being formed under a slot recessed into said substrate such that such channel includes both a horizontal and a vertical region;

a first gate member surrounded with insulation extending from at least the edge of said first region to over said horizontal region of said channel, said first gate member storing a charge which affects the conductivity within said horizontal region;

a second gate member extending over said first gate member for controlling the programming and erasing of said cell, said second gate member also being insulated above, and extending over, said vertical region of said channel thereby controlling the current flow across said vertical region.

4,964,081

READ-WHILE-WRITE RAM CELL

Mark S. Birrittella, and Jan A. Wikstrom, both of Chippewa Falls, Wis., assignors to Cray Research, Inc., Eagan, Minn.

Filed Aug. 11, 1989, Ser. No. 393,528
Int. Cl.[5] G11C 13/00
U.S. Cl. 365—189.06 16 Claims

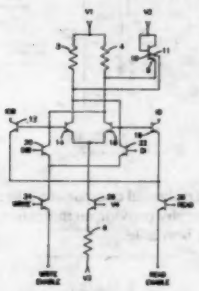
1. A nonsaturating differentially connected transistor memory cell comprising:

first and second transistors, each having a collector, base and emitter, arranged such that said collector of said first

transistor is connected to said base of said second transistor forming a first node, said collector of said second transistor is connected to said base of said first transistor forming a second node, and said emitters of said first and second transistors are connected together forming a third node;

a constant current source coupled between said third node and a first electrical voltage establishing a predetermined substantially constant current through said third node wherein the sum of the currents through said first and second transistor emitters are restricted by said constant current source;

a first load providing an impedance coupled between said first node and a second electrical voltage;



a second load providing an impedance coupled between said second node and a third electrical voltage; and

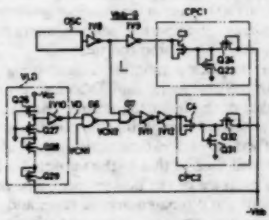
a saturation prevention circuit including a third transistor having a collector, base, and first and second emitters, arranged such that said collector and said base of said third transistor are connected both together and to a fourth electrical voltage forming a fourth node, said first emitter of said third transistor connected to said first node and said second emitter of said third transistor connected to said second node, said saturation prevention circuit operative to turn on said third transistor to prevent saturation of said first and second transistors.

4,964,082

SEMICONDUCTOR MEMORY DEVICE HAVING A BACK-BIAS VOLTAGE GENERATOR

Katsuyuki Sato, Kodaira, and Kazumasa Yanagisawa, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 763,615, Aug. 8, 1985, Pat. No. 4,775,959.
This application Sep. 27, 1988, Ser. No. 249,660
Claims priority, application Japan, Aug. 31, 1984, 59-180534
Int. Cl.[5] G11C 7/02
U.S. Cl. 365—189.09 **34 Claims**



1. A semiconductor memory device comprised of at least an insulated gate field effect transistor having a substrate gate to which a back-bias voltage is supplied, wherein said semiconductor memory comprises:

word lines;

data lines;

memory cells disposed to correspond to points of intersection between said word lines and said data lines, wherein each of said memory cells includes a capacitor coupled to a MOSFET, for storing a data signal;

a first selecting means for selecting one of said word lines;

a second selecting means for selecting one of said data lines;

an output means for outputting a data signal stored in a memory cell which is selected by said first and second selecting means;

a back-bias voltage generation means for generating said back-bias voltage; and

a level detection means for detecting a level of said back-bias voltage produced by said back-bias voltage generation means,

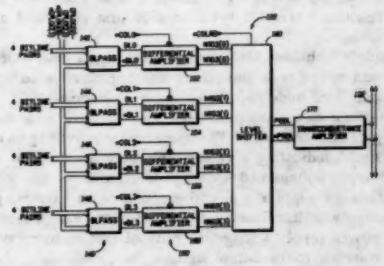
wherein said back-bias voltage generation means includes a first means for generating said back-bias voltage in response to pulse signals, and a second means controlled in response to an output of said level detection means, for generating said pulse signals.

4,964,083

NON-ADDRESS TRANSITION DETECTION MEMORY WITH IMPROVED ACCESS TIME

Scott G. Nogle, and Stephen T. Flannagan, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 27, 1989, Ser. No. 344,200
Int. Cl.[5] G11C 7/00
U.S. Cl. 365—189.11 **10 Claims**



3. A memory comprising:

a plurality of memory cells, each memory cell providing a pair of complementary bit line signals when selected;

input means for receiving an address and selecting a memory cell in response thereto;

a differential amplifier, coupled to the input means, for providing a pair of complementary amplified signals responsive to the complementary bit line signals provided by a memory cell selected by the input means;

a level shifter, coupled to the differential amplifier, for providing a pair of complementary level-shifted signals responsive to the complementary amplified signals;

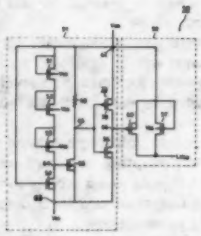
a transconductance amplifer, coupled to the level shifter and having complementary outputs, for providing a differential current on said complementary outputs responsive to the complementary level-shifted signals; and

output means, coupled to the transconductance amplifier, for providing an output data signal external to the memory at a logic state representative of the differential current at the outputs of the transconductance amplifier.

4,964,084
STATIC RANDOM ACCESS MEMORY DEVICE WITH VOLTAGE CONTROL CIRCUIT

Tae-Sung Jung, Boochun, and Kyu-Hyun Choi, Seoul, both of Rep. of Korea, assignors to SamSung Electronics Co., Ltd.

Filed Dec. 30, 1988, Ser. No. 292,449
Claims priority, application Rep. of Korea, Dec. 15, 1988, 1988-16713
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—226 16 Claims



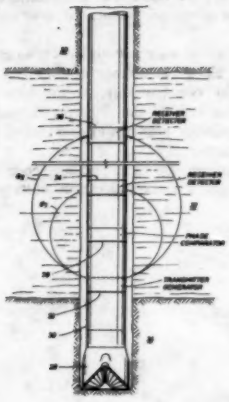
1. A static random access memory device comprising:
a plurality of word lines;
a plurality of pairs of bit lines;
a plurality of memory cells each coupled to corresponding ones of said word lines and between each of corresponding ones of said pairs of bit lines, a plurality of N-channel MOS transistors having drain and gate electrodes each coupled together, being connected between a first node and a second node;
a N-channel MOS transistor having a drain-source path coupled between said second node and a reference voltage node, and having a gate coupled to said first node;
a resistance coupled between said first node and a third node;
a third N-channel MOS transistor having a gate coupled to said second node and a drain-source path coupled between said third node and the reference voltage node;
inverting means coupled between said third node and the gate of P-channel MOS transistors for providing an output signal indicating a relation between an external power supply voltage and a voltage level; and
means for supplying selectively one of an external power supply voltage and a voltage lower than the external power supply voltage, to each of said memory cells, in response to the output signal.

4,964,085
NON-CONTACT BOREHOLE CALIBER MEASUREMENT

Daniel F. Coope, and John E. Fontenot, both of Houston, Tex., assignors to Baroid Technology, Inc., Houston, Tex.

Filed Feb. 25, 1986, Ser. No. 833,364
Int. Cl.[5] G01V *1/28*
U.S. Cl. 367—35 11 Claims

1. A method for determing changes in the caliber of a borehole utilizing borehole compensated measuring equipment having a transmitter and at least two receivers spaced from said transmitter and from each other, said method comprising the steps of:
transmitting a signal from said transmitter into said borehole, said signal having components reflecting along the borehole walls and components entering the formation;
receiving said signal at each said receiver;
comparing at least one property of said signal received at either of said receivers with said property of the said transmitted signal, whereby said comparison is indicative of changes int eh caliber of said borehole; and

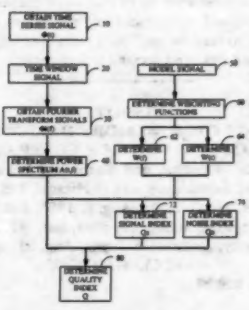


generating from only said comparison a log indicative of said changes to thereby provide an indication of changes int he caliber of the borehole.

4,964,086
METHOD FOR CHARACTERIZING VELOCITY ESTIMATES

Richard J. O'Connell, Cambridge, Mass.; Chandra S. Rai, Tulsa, and Carl H. Sondergeld, Broken Arrow, both of Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Oct. 20, 1989, Ser. No. 424,430
Int. Cl.[5] G01V *1/30*
U.S. Cl. 367—38 12 Claims



12. A method for characterizing seismic velocity estimates obtained from arrival times in time series signals representative of the traveltimes of imparted seismic energy propagating through the earth, comprising the steps of:
obtaining a weighting function constraining the spectral content of the time series signal about an estimated arrival time to that of the imparted seismic energy;
obtaining a second weighting function constraining the temporal extent of the time series signal about the estimated arrival time to that of the imparted seismic energy;
obtaining a measure of the power spectra of the time series signal about the estimated arrival time; and
characterizing the estimated velocity with a product of the first and second weighting functions and the power spectra.

4,964,087

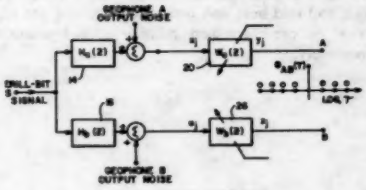
SEISMIC PROCESSING AND IMAGING WITH A DRILL-BIT SOURCE

Bernard Widrow, Stanford, Calif., assignor to Western Atlas International, Houston, Tex.

Division of Ser. No. 939,359, Dec. 8, 1986, Pat. No. 4,849,945. This application Mar. 13, 1989, Ser. No. 292,552

Int. Cl.[5] G01J *1/00*

U.S. Cl. 367—45 **4 Claims**



1. Apparatus for determining while drilling in the earth with a drill bit the positions of seismic wave reflecting geologic formations in the earth, said drill bit serving to generate the seismic waves, which comprises at least one pair of seismic wave sensors positioned in the earth near the surface thereof, in at least one pair of known positions with respect to said borehole, said seismic waves generated by said drill bit which travel directly to said sensors and second seismic waves generated by said drill bit which are reflected by the geologic formations, at least one pair of adaptive filtering means each connected to receive sensed signals from one of said at least one pair of seismic wave sensors, means utilizing an adaptation algorithm to adapt said at least one pair of adaptive filtering means to optimize a crosscorrelation function between their outputs, impulse responses of said at least one pair of adaptive filtering means after convergence yielding arrival times and amplitudes of direct and reflected waves from said drill bit.

4,964,088

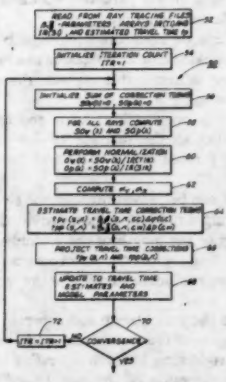
METHOD FOR TOMOGRAPHICALLY LATERALLY VARYING SEISMIC DATA VELOCITY ESTIMATION

Chittibabu Chittineni, Newark, Del., assignor to Conoco Inc., Ponca City, Okla.

Filed Oct. 31, 1989, Ser. No. 430,704

Int. Cl.[5] G01V *1/28*

U.S. Cl. 367—51 **18 Claims**



1. A method of seismic energy processing to determine estimated velocities using a diffraction tomographic technique, comprising the steps of:

inputting pre-processed and dynamically corrected seismic section data as derived for selected sources and receivers along a line of survey over an inhomogeneous earth medium;

determining true travel times between each source and each receiver for specific reflectors of the section data;

estimating travel times and sensitivity matrix parameters with respect to model parameters of the section data for source-reflector-receiver rays of an initial model;

receiving the true travel times and the estimated model travel times and determining ray-based parameter corrections by designating the earth medium as a predetermined array of cells of selected size and determining energy velocities at respective cell corners, and energy reflectors in terms of cell depth;

updating the model parameters as a weighted combination of the ray-based corrections;

iterating the steps of determining ray-based parameter corrections and updating the model parameters;

testing the updated travel time parameters to determine if convergence criteria are satisfied such as when there is no appreciable decrease in travel time error; and

outputting the estimated velocities relative to the reflector position for the section data.

4,964,089

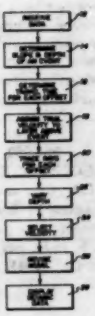
METHOD FOR DERIVATION OF INTERNAL VELOCITIES FROM POST-MIGRATION PARTS

Shein S. Wang; Douglas W. Hanson, and Thomas D. Cavanaugh, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Dec. 22, 1989, Ser. No. 455,692

Int. Cl.[5] G01V *1/36*

U.S. Cl. 367—73 **6 Claims**



1. A method for deriving interval velocities for a new model from post migration parts of an old model comprising the steps of:

receiving seismic data including the old model having several events with layers between said events;

determining the apparent depth and slope of a first event for each offset in the post migrated parts;

determining the travel time of the recorded reflection from said first event for a particular offset by ray-tracing through the old model;

assigning a trial velocity to the layer between said first event and a selected, event in the new model;

tracing rays for each offset from the source to said first event and back to a receiver;

computing a travel time for each ray traced;

varying the depth of said first event up and down until the computed travel time agrees with the measured travel time previously determined;

maintaining the source receiver separation constant for each offset travel time; and

selecting a velocity for the layer between said first event and said selected event for which the depths at each offset are the same.

4,964,090

ULTRASONIC FLUID LEVEL SENSOR

Michael C. McCarthy, Birmingham, Mich., assignor to TRW, Inc., Cleveland, Ohio

Filed Jul. 19, 1989, Ser. No. 381,899

Int. Cl.[5] H04R *17/00*

U.S. Cl. 367—162 **11 Claims**

1. In combination with an ultrasonic fluid level sensor having a spaced transmitter piezoelectric member and a receiver piezoelectric member carried in a housing insertable into a fluid reservoir, the improvement comprising:

a resilient support for resiliently urging at least one of said piezoelectric members toward a ground conductor in a relatively fixed position in said housing, whereby ultrasonic damping of said member is reduced.

4,964,091

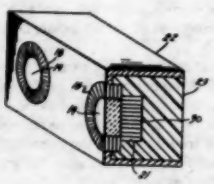
ELECTROACOUSTIC TRANSDUCER

Rufus L. Cook, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 5, 1970, Ser. No. 78,284

Int. Cl.[5] H04R *1/02*

U.S. Cl. 367—165 **24 Claims**



1. An electracoustic transducer having improved pressure and temperature characteristics, comprising in combination:

piezoelectric means having a cylindrical shape for providing conversion between electrical and acoustical energies;

a pressure release collar, having a plurality of hexagonal-shaped honeycomb-like cells, extending around and in contact with the curved surface of said cylindrically shaped piezoelectric means for effecting the acoustically isolating thereof;

a gas filling the plurality of hexagonal-shaped honeycomb-like cells of said pressure release collar for providing acoustic pressure release for the curved surface of said cylindrically shaped piezoelectric means;

heat sink means disposed in thermal contact with said pressure release collar for absorbing heat conducted thereto thereby; and

housing means effectively surrounding predetermined portions of said piezoelectric means, said pressure release collar, and said heat sink means for effecting the support thereof in predetermined relative spatial orientations, respectively.

4,964,092

WRISTWATCH

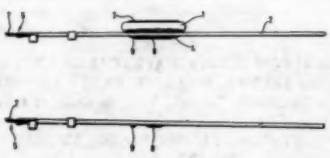
Pius Brida, Schaffhausen, Switzerland, assignor to IWC International Watch Co. AG, Schaffhausen, Switzerland

Filed Sep. 26, 1989, Ser. No. 412,882

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1988, 3832614

Int. Cl.[5] G04B *37/00*

U.S. Cl. 368—282 **5 Claims**



1. A wristwatch including a watchcase and having a watchband consisting of a single part, the watchband having free ends and a buckle, and wherein

the free ends can be connected together by means of the buckle, the buckle being connectable to a bottom region of the watchcase in detachable manner; the wristwatch further comprising

a sleeve which is open at both ends and extends approximately parallel to the dialface of the wristwatch, the sleeve being formed in the bottom of the watchcase and wherein

the watchband can be passed through the sleeve, the watchband including a holding region provided approximately in the center of the length of the watchband; and

within said holding region, the watchcase is fastenable to the watchband by resillient clamping of the watchband in said sleeve;

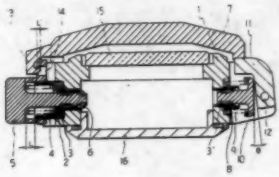
a rigid stop on the watchband; and wherein

the holding region of the watchband is limited on the buckle side by said rigid stop, the stop extending transverse to the longitudinal direction of the watchband and projecting from a surface of the watchband.

4,964,093
OPENING AND CLOSING STRUCTURE OF COVER LID OF WATCH

Haruki Hiranuma, and Nobuhide Matsumoto, both of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed Mar. 16, 1990, Ser. No. 493,516
Claims priority, application Japan, Mar. 15, 1989, 1-29225[U]; Mar. 28, 1989, 1-34959[U]
Int. Cl.[5] G04B *37/00*
U.S. Cl. 368—283 **2 Claims**

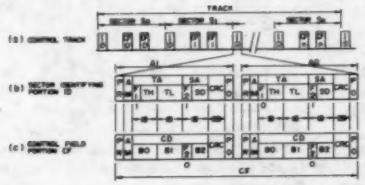


1. In a watch having a casing and means for opening and closing a cover lid, the improvement comprising:
- a button pipe fixed through one side of the casing;
- a coil spring disposed in the button pipe;
- a lock button disposed slideably through the button pipe and biased outward by means of the coil spring and having a recess;
- another pipe fixed through an opposite side of the casing;
- a transmission pin slideably disposed and biased outward in said another pipe;
- a hinge for undergoing opening movement in response to sliding movement of the biased transmission pin; and
- a cover lid having one end portion supported by the hinge and another end portion which has a protrusion engageable with the recess of the lock button.

4,964,094
OPTICAL DISK

Isao Satoh, Neyagawa; Makoto Ichinose, Sakai; Yoshihisa Fukushima, Osaka; Yuzuru Kuroki, Toyonaka; Yuji Takagi, Kadoma, and Yasushi Azumatani, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 11, 1988, Ser. No. 217,308
Claims priority, application Japan, Jul. 15, 1987, 62-176173; Mar. 24, 1988, 63-70062
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—59 **10 Claims**



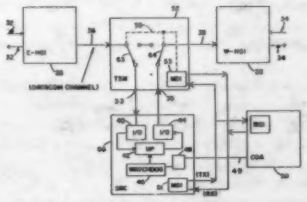
1. An optical disk comprising:
- a plurality of data tracks each divided into a plurality of data track sectors, each of said data track sectors comprising (a) a sector identifying portion ID recording address data and (b) a data field portion DF for recording data, said section identifying portion ID comprising a sync clock portion PR, an address mark portion AM leading the address data, a track address portion TA, a sector address portion SA recording the address data, and an error detection portion CRC;
- a plurality of control tracks recording control data for disk using/operating information representing sector physical formats and disk recording/reproducing information;

said control tracks being formatted similarly to said data tracks and divided into a plurality of control track sectors, each of said control track sectors comprising (a) a sector identifying portion ID and (b) a control field portion CF provided positionally corresponding to said data field portion DF and recording the control data, said sector identifying portion ID comprising a sync clock portion PR, an address mark portion AD, a track address portion TA, a sector address portion SA and an error detecting portion CRC; said control field portion CF being formatted similarly to said sector identifying portion ID and comprising a sync clock portion PR, an address mark portion MA, control data portions CD recording parts of said control data with locations corresponding to those of said track address portion TA and said sector address portion SA, and an error detecting portion CRC; said control field portion CF and said sector identifying portion ID further including respective identification flags to enable discrimination between them.

4,964,095
DATA COMMUNICATION BYPASS APPARATUS AND METHOD

Raymond E. Tyrrell, and Manal E. Afify, both of Raleigh, N.C., assignors to Alcatel NA, Inc., Hickory, N.C.

Filed May 12, 1989, Ser. No. 351,389
Int. Cl.[5] H04J *3/08*
U.S. Cl. 370—55 **16 Claims**



1. A low speed channel bypass apparatus for use with an add/drop multiplexer, the add/drop multiplexer having an east high speed interface for receipt of a high speed communication channel comprising a plurality of lower speed channels, a west high speed interface for transmitting the high speed channel downstream, a time slot multiplexer interconnected between the east high speed interface and the west high speed interface, the time slot multiplexer having means for removing one or more low speed channels from the high speed channel and for adding one or more low speed channels to the high speed channel as well as means for interconnecting east low speed channels to west low speed channels, a non-redundant network controller interconnected with the time slot multiplexer for directing the adding and removing of low speed channels by the time slot multiplexer with respect to the high speed channel, wherein the bypass apparatus comprises:
- (A) means for monitoring the operation of the network controller, said means generating a status signal for suspending operation of the network controller if said means determines that the network controller is operating in a failed mode; and
- (B) means, sensing the network controller status signal, for reprovisioning the time slot multiplexer upon detection of the network controller monitoring means status signal, so as to connect one or more east low speed channels to west low speed channels;

whereby one or more low speed channels are bypassed through the time slot multiplexer from the east high speed

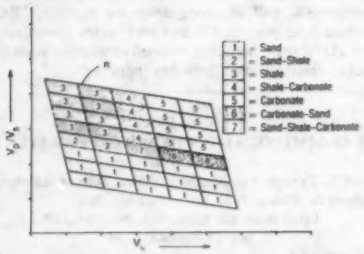
interface to the west high speed interface regardless of their previous interconnections under the prior control of the network controller, thereby providing for continued communications for each selected low speed channel when a non-redundant network controller is operating in a failed mode.

4,964,096

METHOD FOR INVERSION OF SEISMIC DATA TO YIELD ESTIMATES OF FORMATION LITHOLOGY

Gary M. Ruckgaber, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed May 24, 1988, Ser. No. 197,947
Int. Cl.[5] G01V *1/34*
U.S. Cl. 367—70 **14 Claims**



1. A method for displaying estimates of selected combinations of formation lithology obtained from seismic reflectivity data, comprising the steps of:

(a) forming a coordinate system having first and second axes each representative of selected formation elastic properties;

(b) enclosing a region on the coordinate system defining a relationship between selected combinations of formation lithology and the selected formation elastic properties;

(c) subdividing the enclosed region into a plurality of bins, wherein each bin corresponds to a selected combination of formation lithologies;

(d) assigning a numeric identifier to each bin representative of separate combinations of formation lithologies;

(e) crossplotting pairs of selected formation elastic properties obtained from the seismic reflectivity data on the coordinate system and associating each crossplotted pair of selected formation properties with a numeric identifier corresponding to a selected combination o formation lithologies;

(f) transforming each numeric identifier associated with a selected combination of formation lithology into a selected color; and

(g) plotting the selected colors as a chromatic lithology section wherein each color represents a selected combination of formation lithologies.

4,964,097

THREE DIMENSIONAL IMAGE CONSTRUCTION USING A GRID OF TWO DIMENSIONAL DEPTH SECTIONS

Shein S. Wang; Douglas W. Hanson, and Thomas D. Cavanaugh, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jan. 2, 1990, Ser. No. 459,911
Int. Cl.[5] G01V *1/36*
U.S. Cl. 367—73 **8 Claims**

1. A method for constructing a three dimensional velocity model from two dimensional data comprising the steps of:

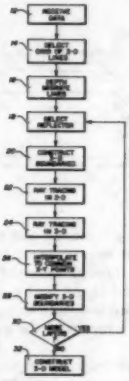
receiving two dimensional seismic data in the form of time migrated time sections;

selecting a grid of seismic lines, each seismic line having a time migrated time section associated therewith;

depth migrating said time migrated time sections associated with each line of said selected grid of seismic lines;

selecting a reflector from said depth migrated seismic sections;

constructing boundaries in three dimensions corresponding to said reflector;



shooting rays from said selected reflector in two dimensions to obtain a first set of data points;

shooting normal rays from said constructed boundaries in three dimensions to obtain a second set of data points;

interpolating said first set of data points and said second set of data points to common x-y points;

modifying said three dimensional boundaries to coincide with said common x-y points; and

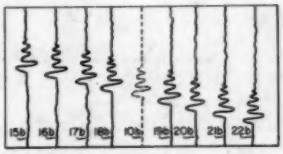
constructing a modified three dimensional velocity model.

4,964,098

METHOD FOR SEISMIC TRACE INTERPOLATION

Scott C. Hornbostel, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Mar. 15, 1990, Ser. No. 493,885
Int. Cl.[5] G01V *1/36*
U.S. Cl. 367—73 **5 Claims**



1. A method for interpolating seismic data, which comprises,

establishing a trace window containing a plurality of seismic traces over a period of time,

selecting a plurality of dips defining a plurality of dip ranges within said trace window,

generating a trace estimate for each of said dip ranges, comprising the steps of,

filtering each one of a plurality of frequency components of said seismic traces by mathematically integrating a time shift in said frequency components across said dip ranges, and

summing said filtered frequency components,

demodulating each of said seismic traces to obtain respective trace envelopes,

generating a weighting function for each of said dips corresponding to the correctness of said dip,

weighting each of said trace estimates with the weighting function of said trace estimate's respective dip, and

summing said weighted trace estimates to generate an interpolated trace.

4,964,099

METHOD OF ESTABLISHING A STRATIGRAPHIC MODEL OF THE SUBSURFACE FROM AN ACOUSTIC IMPEDANCE PROFILE AND A SEISMIC SECTION

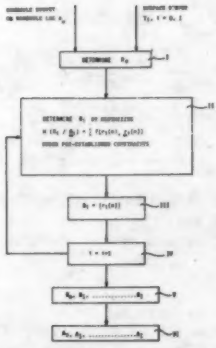
Didier Carron, Saint Maur des Fossés, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jun. 13, 1989, Ser. No. 365,465

Claims priority, application France, Jun. 13, 1988, 88 07818

Int. Cl.[5] G01V *1/28*

U.S. Cl. 367—73 **22 Claims**



1. A method of establishing a stratigraphic model of the subsurface from an acoustic impendance profile $A_o=\{a_o(n),n=1, N\}$ corresponding to a series of reflection coefficients $R_o=\{r_o(n),n=1, N\}$, where n is an index relating to the depth sampled in time t, and from a seismic section comprising a plurality of seismic traces $T_i(t),i=0, I$ recorded in response to the emission of a seismic wave of signature W(t), the method comprising the steps of;

successively determining each series of coefficients $R_i=\{r_i(n), N=1, N\}$ by minimizing a cross-entropy function $H(R_i/R_i)$ between firstly a series R_i obtained from the series R_{1-1} and a set of one or more seismic traces $\{T_{i-j}, T_{i+j}\}$, and secondly the looked-for series R_i, said minimization being performed under pre-established constraints;

determining the acoustic impedance profiles $A_i=\{a_i(n))\}$ corresponding to the series R_i; and

establishing said stratigraphic model of the subsurface from the acoustic impedance profiles A_i.

4,964,100

ACOUSTIC DETECTION SYSTEM

Nassy Srour, Silver Spring, Md., and Michael V. Scanlon, Springfield, Va., assignors to The United States of America as Represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 1, 1989, Ser. No. 444,335

Int. Cl.[5] H04R *15/00*

U.S. Cl. 367—178 **17 Claims**

1. A portable acoustic detection device for detecting low amplitude acoustic waves in the range of 0 to 4,000 Hz comprising:

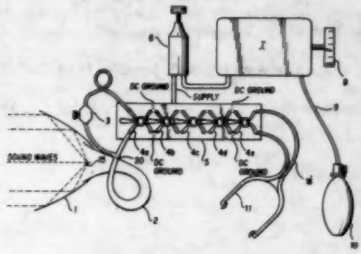
a deep parabolic dish antenna having a focal point within the concave portion of said dish;

a fluidic amplifying means having a high amplitude cut-off to amplify said low amplitude acoustic waves;

acoustic amplifying means connected between said parabolic dish and said fluidic amplifying means;

listening means connected to said fluidic amplifying means;

wherein said fluidic amplifying means comprises a fluidic gainblock having a plurality of staged laminar proportional amplifiers and fluid supply means for said gainblock; wherein said fluid supply mean comprises a fluid storage container and a pressure regulator and a hand powered pump means for pressurizing said fluid storage container.



4,964,101

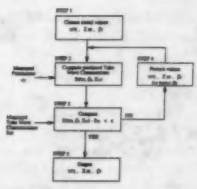
METHOD FOR DETERMINING FLUID MOBILITY CHARACTERISTICS OF EARTH FORMATIONS

Hsui-lin Liu, Ridgefield, Conn., and Philip S. Cheung, Le Vesinet, France, assignors to Schlumberger Technology Corp., New York, N.Y.

Filed Mar. 23, 1989, Ser. No. 327,852

Int. Cl.[5] G01V *1/40*

U.S. Cl. 367—31 **8 Claims**



1. A method for determining the mobility of fluid movement in a formation traversed by a borehole, comprising:

generating an acoustic tube wave in a selected interval of the borehole;

measuring one or more characteristics of the tube wave in said interval of the borehole;

generating a test characteristic using a test value for mobility, including contributions from the following:

(a) a first contribution to said test characteristic derived from a change in the borehole volume due to elastic deformation of the formation surrounding the borehole,

(b) a second contribution to said characteristic derived from a loss of acoustic energy due to fluid movement relative to the formation matrix,

(c) a finite mudcake impedance contribution Z_m which modifies the loss of acoustic energy due to fluid movement relative to the formation matrix, wherein Z_m is approximately within the range $(1/\omega)10^{10}$–10^{11} dynes-sec/cm^3, where ω is the angular frequency of the measured tube wave-component, and

(d) a mudcake layer contribution to said characteristic derived from a volume change in the borehole due to elastic deformation of the mudcake;

adjusting the test value to minimize any mismatch between the measured characteristic and the generated test charac-

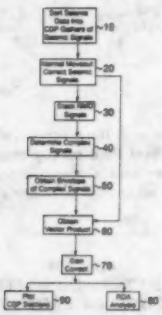
teristic, whereby the test value which gives the best match is determined to be representative of the mobility of said formation.

4,964,102

METHOD FOR ENHANCING AND EVALUATING SEISMIC DATA

Michael C. Kelly, Harvey, and Richard O. Lindsay, New Orleans, both of La., assignors to Amoco Corporation, Chicago, Ill.

Filed Apr. 19, 1988, Ser. No. 183,872
Int. Cl.[5] G01V *1/34, 1/36*
U.S. Cl. 367—47 **16 Claims**



1. A method for suppressing random noise and coherent noise exhibiting residual normal moveout and for enhancing primary reflection events, while preserving geologically induced amplitude variations as a function of range, in incident-angle-ordered gathers of seismic signals comprising the steps of:

(a) correcting incident-angle-ordered gathers of seismic signals for differences in traveltime to and from a common reflection point;

(b) summing the corrected seismic signals and obtaining a stacked signal;

(c) obtaining an amplitude envelope representative of the stacked signal; and

(d) obtaining a vector product of the amplitude envelope and each seismic signal of the incident-angle-ordered gather of seismic signals and suppressing random noise and coherent noise exhibiting residual normal moveout and enhancing primary reflection events while preserving its geologically-inducted amplitude variations as a function of range.

4,964,103

THREE DIMENSIONAL BEFORE STACK DEPTH MIGRATION OF TWO DIMENSIONAL OR THREE DIMENSIONAL SEISMIC DATA

James H. Johnson, Houston, Tex., assignor to Conoco Inc., Ponac City, Okla.

Filed Jul. 13, 1989, Ser. No. 380,228
Int. Cl.[5] G01V *1/36*
U.S. Cl. 367—53 **17 Claims**

1. A method to provide a three dimensional before stack depth migration of seismic data comprising the steps of:

receiving seismic data as seismic traces;

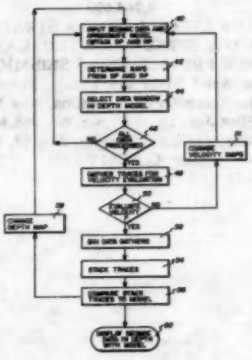
receiving an approximate depth mode;

determining approximate locations for predetermined segments of said seismic traces;

moving said predetermined segments to said approximate locations;

scaling said predetermined segments to depth by obtaining three dimensional source and receiver positions on each trace and deriving a three dimensional raypath from the source to a primary objective map and to the receiver by locating raypaths having emergence points within a predetermined area around said receiver position;

binning said scaled predetermined segments according to reflection point location;



stacking said scaled predetermined segments contained in each bin;

comparing said stacked scaled segments to said three dimensional model; and

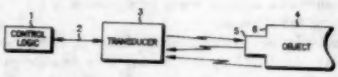
modifying said three dimensional model to conform to said stacked scaled segments.

4,964,104

SYSTEM FOR MEASURING POSITION USING ELECTRONIC OR ULTRASONIC DEVICES

Zbynek A. Capurka, Palatine, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jan. 9, 1989, Ser. No. 294,538
Int. Cl.[5] G01S *15/06*
U.S. Cl. 367—99 **6 Claims**



1. A system for determining the position of a known moving object including:

(a) first means, separate from the moving object, for sending signals to and receiving reflected signals from the moving object;

(b) a first reflective surface associated and moving with the moving object;

(c) a second reflective surface associated and moving with the moving object and maintaining a known, fixed distance from said first reflective surface;

(d) second means coupled to said first means for:

(i) determining a first value of time related to the time between said first means sending a signal to the moving object and receiving at least one reflection of said signal from the moving object;

(ii) determining a second value of time related to the time between sending said signal to the moving object and receiving at least one additional reflection of said signal;

(iii) using said first and second values of time and said known fixed distance to facilitate identifcation of valid signal reflections by said first and second surfaces and using time values for identified valid signal reflections from said first and second surfaces, and said known

fixed distance, for determining a position of the moving object with respect to said first means;

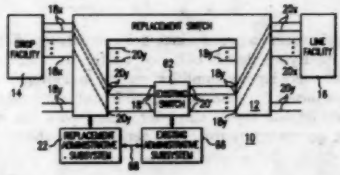
wherein said second means opens at least one time window, after reception of said at least one reflection by said first means, during which reflections of said signal from said second reflective surface are expected to be received.

4,964,105

REPLACEMENT SWITCH

Duane E. Schrodt, Allen, and David D. Wilson, McKinney, both of Tex., assignors to DSC Communications Corporation, Plano, Tex.

Filed Nov. 1, 1988, Ser. No. 265,584
Int. Cl.[5] H04J 3/02
U.S. Cl. 370—16 37 Claims



36. A replacement switch for replacing an existing switch for transferring a plurality of communication spans from a line facility to a drop facility, comprising:

a first switching matrix;

means for configuring said first switching matrix;

a second switching matrix;

means for configuring said second switching matrix differently from said first switching matrix; and

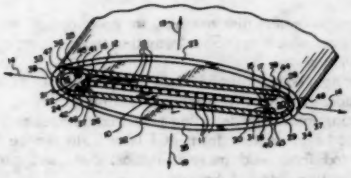
means, coupled to said first and second switching matrices, for deselecting said existing switch and for selecting only one of said first and second switching matrices to transfer said plurality of communication spans.

4,964,106

FLEXTENSIONAL SONAR TRANSDUCER ASSEMBLY

George Bromfield, Salt Lake City, Utah, assignor to Edo Corporation, Western Division, Salt Lake City, Utah

Filed Apr. 14, 1989, Ser. No. 337,857
The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.
Int. Cl.[5] H04R 17/00, 31/00
U.S. Cl. 367—165 10 Claims



1. A flextensional sonar transducer assembly including

a stack of piezoelectric elements disposed along a linear axis,

a plurality of electrodes disposed between said elements,

means for conducting electrical signals to and from said electrodes,

end pieces disposed at each end of said stack, said end pieces having outwardly facing arcuate surfaces and center apices,

a compression band formed into a loop to extend along one side of said stack, arcustely about one of said end pieces and back along the other side of said stack, and arcuately about the other of said end pieces to said one side,

a flexural shell disposed to circumscribe said compression band to present an elliptical side cross-section, with the major axis thereof being coincident with said linear axis, and said shell being reactively coupled to the arcuate end portions of said compression band so that an inwardly directed transverse movement of the long sides of said shell toward said stack, allows for longitudinal expansion of said stack, and an outwardly directed transverse movement of the long sides of said shell away from said stack, causes longitudinal compression of said stack, and

means positioned between said compression band and at least one of said end pieces for urging the compression band away from the end piece to thereby produce a tensile stress in the band and a compressive stress in the stack

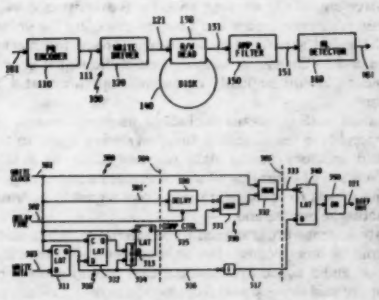
whereby, said urging means maintains driving contact between said stack and said shell through said compression band.

4,964,107

RELATIVE TIMING PRECOMPENSATION OF HIGH-SPEED PULSE SIGNALS FOR DIGITAL MAGNETIC RECODING

Richard L Galbraith; Raymond A. Richetta, both of Rochester, and Timothy J. Schmerbeck, Kasson, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 14, 1990, Ser. No. 493,188
Int. Cl.[5] G04F 8/00; G11B 5/09
U.S. Cl. 368—120 14 Claims



1. A timing-compensation circuit for a high-speed magnetic recording device, comprising:

an input for a raw clock pulse signal:

an input for a raw data pulse signal:

an input for a delay-code digital signal;

a sequence detector responsive to a predetermined pattern of pulses in said raw data signal for producing a compensation signal;

a set of at least three identical delay units, a first and a second of said delay units coupled to said raw clock signal, and a third of said units coupled to said raw data signal, said second delay unit being further responsive to said delay-code signal for producing a compensated clock signal having a time delay differing from those of said first and second delay units:

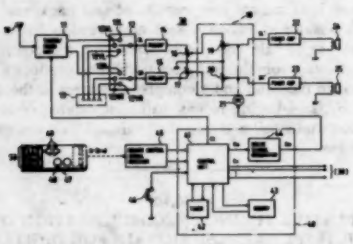
gating logic coupled to said set of delay units for producing a final clock signal corresponding to either said raw clock signal or said compensated clock signal in response to said compensation signal:

a latch for producing a final data pulse signal in response to said raw data signal and timed in response to said final clock signal.

4,964,108
VOLUME CONTROL FOR SOUND REPRODUCING APPARATUS

Masahiro Obtsu, and Tohru Kurita, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 24, 1989, Ser. No. 383,422
Claims priority, application Japan, Jul. 29, 1988, 63-189691; Jul. 29, 1988, 63-189692
Int. Cl.[5] G11B *31/00*
U.S. Cl. 369—19 14 Claims



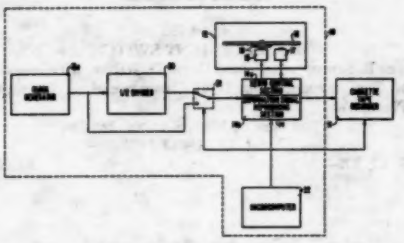
1. A sound reproducing apparatus comprising:
audio signal input means;
sound producing means for generating sound in response to the application of an audio signal thereto;
audio signal processing means operative to receive an audio signal from said input means and including variable resistance means through which the received audio signal is applied to said sound producing means, and actuator means for said variable resistance means operable by a drive signal for varying an effective resistance value of said resistance means and thereby changing the volume of the sound generated by said sound producing means;
time control means for causing said audio signal processing means to automatically commence operation at a preset time;
duration setting means including memory means, means operable in response to a duration setting signal to store in said memory means data corresponding to a selected duration of operation of said actuator means, and generating means for generating said drive signal to operate said actuator means; and
control means programmed to be operative, when said time control means causes the commencement of operation of said audio signal processing means at said preset time, to apply said drive signal from said generating means to said actuator means for said selected duration corresponding to said data stored in the memory means so as to determine said volume of the sound from said sound producing means at the end of said duration.

4,964,109
FAST SPEED REPRODUCTION SYSTEM FOR DIGITAL DISC

Yo Yoshioka, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Aug. 5, 1988, Ser. No. 228,619
Claims priority, application Japan, Aug. 5, 1987, 62-194294; Oct. 9, 1987, 62-255001; Oct. 9, 1987, 62-255002
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.11 6 Claims

1. A digital disc reproduction system comprising:
disc reproducing means for driving a disc and reading information from the disc;
signal processing means for processing the information read from the disc by the disc reproducing means to obtain signals and for supplying control signals to the disc reproducing means in order to servo control the disc reproducing means;
clock generator means for generating a plurality of different frequency clocks; and
means for selecting and supplying one of the different frequency clocks to the signal processing means; and
wherein

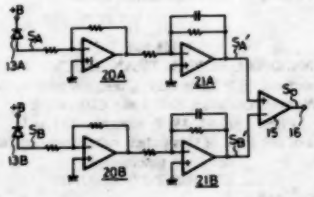


the signal processing means includes a signal amplifier means for amplifying signals obtained by the disc reproducing means, said signal amplifier means including feedback circuit means for determining the frequency band characteristic of said signal amplifier means with the selected clock generated by the clock generator means.

4,964,110
APPARATUS FOR REPRODUCING A MAGNETO-OPTICAL DISK USING A SHOT NOISE REDUCTION CIRCUIT

Hideyoshi Horimai, Miyagi, and Hiroshi Ogawa, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 3, 1988, Ser. No. 189,710
Claims priority, application Japan, May 28, 1987, 62-132392
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—110 7 Claims



1. An apparatus for reproducing a magneto-optical disk comprising:
a magneto-optical disk having a magneto-optical recording medium which permits information signals to be optically rewritten;
a laser light source for emitting a light beam to said magneto-optical disk at a predetermined sampling period;
detecting means for detecting polarized components of said light beam emitted from said laser light source and reflected from said magneto-optical disk, and providing respective detected outputs;
a differential amplifier means for obtaining the difference between the respective detected outputs from said detecting means; and
first and second random noise conversion means each receiving one of said detected outputs provided at a rear stage of said detecting means and connected at a preceding stage of said differential amplifier means for converting random noise in each of said respective detected outputs into respective direct current noise combined with said detected outputs and fed to respective inputs of said

differential amplifier means, whereby said direct current random noise is cancelled in an output of said differential amplifier.

4,964,111

SLIDER CONTROL DEVICE FOR DISK PLAYER

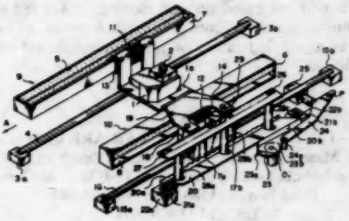
Toshimasa Hangai; Koichi Ishitoya, and Akihiko Tagawa, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 4, 1989, Ser. No. 417,158

Claims priority, application Japan, Feb. 20, 1989, 1-41367

Int. Cl.[5] G11B *17/30, 17/22;* H04N *5/76*

U.S. Cl. 369—215.000 **6 Claims**



1. A slider control device in a disk player comprising a pickup for reading recorded information on an information recording disk, a slider holding said pickup and provided movably in the radial direction of said information recording disk, and a driving means for moving said slider, said slider control device comprising:

storing means for storing normal speed information of said slider in each operation mode of said disk player;

speed detecting means for detecting the moving speed of said slider; and

control means for driving and controlling said driving means based on the comparison result obtained by comparing the moving speed information obtained from said speed detecting means in each operation mode of said disk player and the normal speed information in the corresponding operation mode obtained from said storing means.

4,964,112

METHOD FOR MONITORING THE QUALITY OF A DIGITAL SIGNAL IN SECTIONS OF A DATA TRANSMISSION CIRCUIT

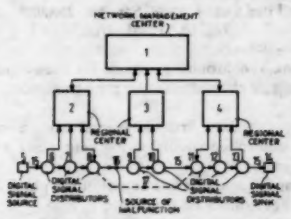
Wolfgang Appelmann, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 9, 1989, Ser. No. 349,431

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1988, 3818716

Int. Cl.[5] H04J *3/14*

U.S. Cl. 370—13 **2 Claims**



1. A method for quality monitoring a digital signal in sections of a data transmission circuit, characterized in that a digital signal (STM-1) which has a bit rate of 155.52 Mbit/s or a multiple thereof in a digital signal (STM-n) of, a higher order of a synchronous digital signal hierarchy is monitored according to the CCITT draft recommendations G.70X, G.70Y and G.70Z, with a parity monitoring with a BIP-8 code word as a B3 byte of a path overhead (VC-4 POH) of a virtual container (VC-4) for a bit rate of 149.72 Mbit/s; wherein sections between a digital signal source (5) of the digital signal (STM-1) and a first digital signal distributor (6), and between respectively two neighboring digital signal distributors (6, 7; 7, 8; 8, 9; 9, 10; 10, 11; 11, 12; 12, 13) and between the last digital signal distributor (13) and a digital signal sink (14) of the digital signal (STM-1) are selected along a data transmission circuit (15); and the BIP-8 code word is supplied, first, as an auxiliary BIP-8 code word (B4) and, second, as a correction code word into two selected Z time slots (Z4, Z5) in the digital signal source (5) or in the first digital signal distributor (6) when it receives arbitrary but identical code words in two selected Z time slots (Z4, Z5) of the path overhead (VC-4 POH); and that every digital signal distributor (6 through 13) receives both auxiliary BIP-8 code words (B4) supplies two new auxiliary BIP-8 code words (B4), and compares at least one of these code words to the corresponding, received auxiliary BIP-8 code word (B4) and reports a deficiency or the present condition to a center (1 through 4) of a centrally controlled emergency network switching system; and in the digital signal sink (14) evaluates at least one of the received auxiliary BIP-8 code words (B4).

4,964,113

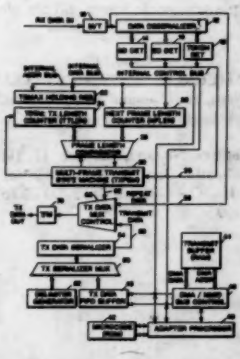
MULTI-FRAME TRANSMISSION CONTROL FOR TOKEN RING NETWORKS

Joel Erwin Geyer, Cary; Joseph K. Lee, and Kenneth T. Wilson, both of Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 20, 1989, Ser. No. 424,850

Int. Cl.[5] H04J *3/02*

U.S. Cl. 370—85.5 **15 Claims**



1. A method for controlling the transmission of frames onto a token ring in a computer network at an originating station, wherein each station in the network is capable of transmitting multiple frames onto the ring during a transmission time window after acquiring a transmit token, with each frame transmitted onto the ring having a frame header, an information field, and a frame trailer, said method comprising the steps of:

determining the maximum frame byte length that can be transmitted during the transmission time window;

transmitting frames waiting in a transmit buffer at said originating station and tracking the total number of bytes transmitted; and

terminating the transmission of frames if the transmission of the next frame waiting to be transmitted results in the total

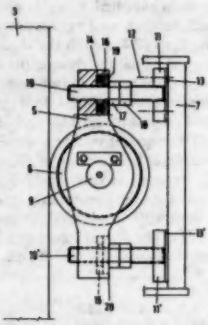
number of bytes transmitted exceeding the maximum frame byte length.

4,964,114

ELECTRODE POSITIONING MECHANISM

Hans-Ladwig Schaller; Hans-Joachim Schubert, both of Moers, and Ewald Feuerstacke, Dorsten, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Düsseldorf, Fed. Rep. of Germany

Filed May 26, 1989, Ser. No. 358,305
Int. Cl.[5] H05B *7/10*
U.S. Cl. 373—94 **19 Claims**



1. Electrode positioning apparatus for an electric arc furnace wherein the electrode is supported by a mast arm and guide column and the guide column is supported for vertical movement by guide roll means mounted on a guide frame, said electrode positioning apparatus comprising:

vibration damping means interposed between said guide roll means and said guide frame;

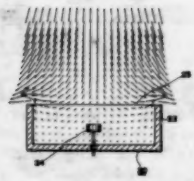
said vibration damping means being configured to vibrationally decouple said guide frame and the electrode.

4,964,115

THERMAL SENSING SYSTEM

Akio Tajima, Nara, and Katsumi Ishii, Sakurai, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 132,162, Dec. 11, 1987, abandoned. This application Jan. 30, 1990, Ser. No. 472,428
Int. Cl.[5] G01K *1/16, 3/00, 7/16*
U.S. Cl. 374—109 **10 Claims**



1. A thermal sensing system for sensing thermal conditions of an environment as a human body would sense said conditions, comprising:

a shell, having an inside face which has good reflectivity for light and heat and a hollow interior space inside said inside face, said shell having an opening into said hollow space, said opening directly exposing the inside of said shell to the environment;

a thermistor assembly which is disposed in said hollow space at a position such that it receives a secondary airflow in the hollow space, induced by but lower than an external airflow of said environment as a human body would receive said airflow and also receives radiant heating effects from said environment, said position such that it receives radiant heating as a human body would, and which changes its electric resistance proportional to temperature changes, and for generating heat by being fed electric power thereto;

control means for controlling a temperature of said thermistor assembly to be a predetermined temperature, by controlling said electric power; and

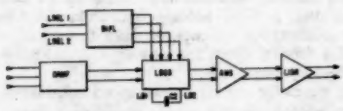
judgement means for determining said environmental thermal conditions based on said electric power fed to said thermistor assembly from said control means, to issue an output signal indicative of said environmental thermal conditions.

4,964,116

DS3 - LINE INTERFACE LINEAR ARRAY (LILA)

Grahame Messor, Gaithersburg, Md., assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Nov. 2, 1988, Ser. No. 266,082
Int. Cl.[5] H04B *3/00*
U.S. Cl. 375—11 **13 Claims**



1. Line interface circuit for binary data signals having a transmitter comprising:

a binary data amplifier;

a transmit line build out network providing a frequency dependent attenuation of the amplified binary data; and

means, connected to said transmit line build out network, for controlling the frequency dependent attenuation characteristics of the line build out network according to a logic word representing a number of discrete attenuation values, with said means for controlling including; a binary to four line converter for converting a two bit logic voltage representing the logic word into a current on one of four lines, and

a selecting stage for the line build out network to select one of four attenuations depending on the current on one of the four lines.

4,964,117

TIMING SYNCHRONIZING CIRCUIT FOR BASEBAND DATA SIGNALS

John S. Shier, Apple Valley, Minn., assignor to VTC Incorporated, Bloomington, Minn.

Filed Oct. 4, 1988, Ser. No. 253,059
Int. Cl.[5] H04L *7/033*
U.S. Cl. 375—108 **12 Claims**

1. A timing synchronizing circuit for recovering a clock from a data signal characterized by state transitions, the circuit comprising:

a phase detector with first and second input terminals;

a voltage controlled oscillator for generating a recovered clock signal;

filter means for coupling the output of the phase detector to the voltage controlled oscillator;

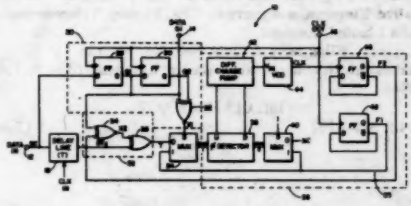
means for generating a feedback signal related to the recovered clock signal;

means for coupling the feedback signal to the first input terminal of the phase detector;

a data input terminal;

state transition detection means coupled to the data input terminal and responsive to the recovered clock signal for generating a signal indicating the occurrence of state transitions of the data signal;

means coupled to the data input terminal for generating a transition timing signal; and



multiplexing means responsive to the state transition detection means for coupling the feedback signal to the second input terminal of the phase detector in the absence of state transitions of the data signal and for coupling the signal indicating occurrence of state transitions to the second input terminal of the phase detector when state transitions in the data signal have been detected.

4,964,118

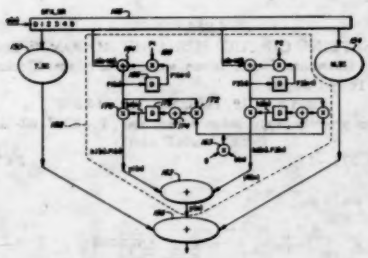
APPARATUS AND METHOD FOR ECHO CANCELLATION

Sami A. H. Aly, Kanata, and Andrew G. Deczky, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 24, 1988, Ser. No. 261,133

Int. Cl.[5] H04B *3/23*

U.S. Cl. 370—32.1 **32 Claims**



1. An echo canceller for a transceiver in a digital transmission system comprising a first cancelling means operative over a first number of baud periods of a digital signal and recursive filter means operative over a second number of baud periods of said signal, said first number of baud periods occuring later in time than said second number of baud periods, said recursive filter means comprising a plurality of taps and means for summing, in each baud period, the respective outputs $F_i(n)$ from said plurality of taps according to the expression:

$$y(n) = \sum_{i=1}^{N} F_i(n)$$

where i is the number of the tap, $F_i(n)$ is the function F(n) for the i^{th} tap, and N is the number of taps, each tap of said recursive filter means being responsive to said digital signal in each of said second number of baud periods for generating an output F(n) comprising the cumulative sum of pulse responses for the signal in preceding baud periods, each of said pulse responses decaying exponentially according to a predetermined function, said echo canceller further comprising means for subtracting in each baud period the instant output of said recursive filter means from a received signal.

4,964,119

METHOD AND SYSTEM FOR PACKET EXCHANGE

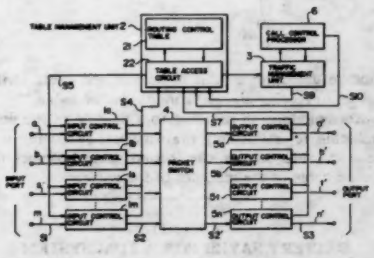
Noboru Endo, Hachioji; Takahiko Kozaki, Koganei; Hiroshi Kuwahara, Kodaira; Kenichi Ohtsuki, Kanagawa, and Shinobu Gohara, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 6, 1989, Ser. No. 334,211

Claims priority, application Japan, Apr. 6, 1988, 63-82927

Int. Cl.[5] H04Q *11/04*

U.S. Cl. 370—60 **14 Claims**



1. A packet exchange method for use in a packet exchange which receives packets from a plurality of call sources and delivers individual packets to predetermined individual output lines, said method comprising the steps of:

assigning to individual input packets information regarding input sequence of the individual input packets in each call each time each input packet of said call is received and storing the input sequence information in a storage; and

delivering said individual input packets sequentially to a predetermined output line and storing, each time each input packet is delivered to said output line, the input sequence information assigned to each packet in said storage as an output sequence information in said call of the delivered packets, and deciding the status of congestion of packets present in said exchange on the basis of said input sequence information and output sequence information.

4,964,120

METHOD OF DETECTING A CABLE FAULT AND SWITCHING TO A REDUNDANT CABLE IN A UNIVERSAL LOCAL AREA NETWORK

Scott S. Mostashari, Phoenix, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 8, 1989, Ser. No. 404,756

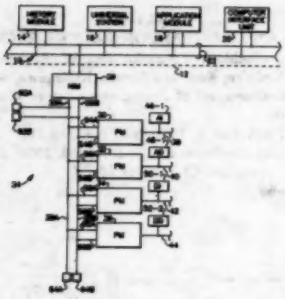
Int. Cl.[5] H04J *1/16*

U.S. Cl. 370—016 **15 Claims**

1. The method by which each active module of a token passing local area network which satisfies IEEE Standard 802.4 communicates over a pair of cables, with each module transmitting the same signals over both cables and receiving signals transmitted over the cables from only one of the cables at a given time, the cable from which a module receives signals at any given time being designated as that modules selected cable and the second cable being its redundant cable, with the selected cable of all modules being the same cable when the network is operating properly; each module has the capability

of detecting a fault in its selected cable, of switching to its second cable and of initiating the re-establishment the network with the second cable as the selected cable of the modules of the network; said method comprising the steps of:

checking to determine if a module's selected cable has a fault; and



a module detecting a fault in its selected cable switching cables to receive signals from its second cable;

the other modules in response to a module of the network initiating re-establishing the network; switching to their second cable, so that the second cable becomes the selected cable of the modules of the network.

4,964,121

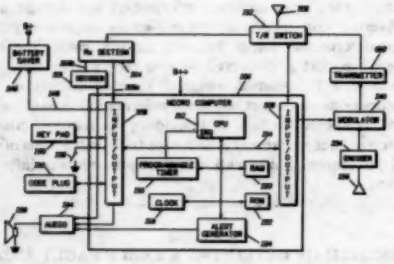
BATTERY SAVER FOR A TDM SYSTEM

Morris A. Moore, West Palm Beach, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 30, 1989, Ser. No. 400,419

Int. Cl.[5] H04B 1/16

U.S. Cl. 370—100.1 **23 Claims**



1. In a time division multiplexed communication system capable of synchronously communicating message signals between a communication resource controller and at least one remote communication unit having a means for reducing power consumption; a method for reducing power consumption in said communication unit, comprising the steps of:

(a) attempting to acquire synchronization during a synchronization acquisition interval;

(b) entering an asynchronous battery saving mode, when synchronization is not acquired, including the step of:

(i) reducing power consumption for a variable asynchronous power saving interval;

(c) entering a synchronous power saving mode when synchronization is acquired including the steps of:

(i) detecting a call request between said communication resource controller and said communication unit,

(ii) reducing power consumption for a synchronous power saving interval when said call request is not detected,

(iii) verifying synchronization presence during a synchronization verification interval;

(d) entering said asynchronous battery saving mode when synchronization is lost.

4,964,122

TDM DATA TRANSMISSION SYSTEM

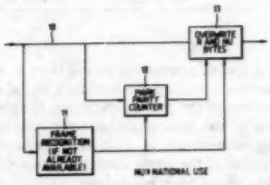
Stephen P. Ferguson, and Allan D. Berry, both of Coventry, United Kingdom, assignors to GEC-Plessey Telecommunications Limited, England

Filed May 2, 1989, Ser. No. 346,126

Claims priority, application United Kingdom, May 9, 1988, 8810948

Int. Cl.[5] H04J 3/07

U.S. Cl. 370—102 **3 Claims**



1. A system for transmitting digital data by time division multiplex (TDM), the system comprising: a transmission terminal for transmitting a TDM data stream having a frame structure which includes user-unavailable bytes forming part of the payload but not normally available to the user, and a receive terminal for the data stream, the transmission terminal having processor means for locating said user-unavailable bytes, and means for overwriting at least some of said user-unavailable bytes to introduce mark parity, and the receive terminal having means for detecting the introduced parity bytes and determining whether there has been an error in transmission.

4,964,123

RESETTING CIRCUIT FOR A MICROCOMPUTER

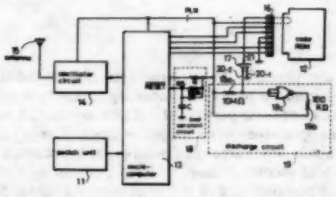
Toshiaki Umemoto, Iwaki, Japan, assignor to Alpine Electronics Inc., Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,890

Claims priority, application Japan, Dec. 16, 1987, 62-319965

Int. Cl.[5] G06F 11/00

U.S. Cl. 371—12 **3 Claims**



1. A resetting circuit for resetting a microcomputer when applying a power source voltage, comprising:

a time constant circuit including a capacitor for generating a reset signal in response to said power source voltage being applied to said microcomputer after a period of time determined by the charging time of said capacitor by said source voltage has passed, said capacitor beginning charging when said source voltage is applied; and,

a discharging circuit for discharging charge stored in the

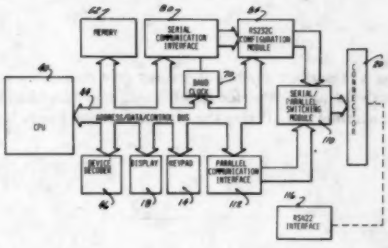
capacitor of the time constant circuit in response to the supply of the source voltage being interrupted.

4,964,124

COMPUTER PERIPHERAL TESTER

David G. Burnett, Southfield, Mich., assignor to World Computer Corporation, Auburn Hills, Mich.

Filed Dec. 27, 1988, Ser. No. 291,108
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—15.1 **11 Claims**



1. A computer peripheral tester for testing a serial or parallel data communication computer peripheral having a data communication cable, the computer peripheral being external to a computer, comprising:

central processing means;

memory means for storing data and control program instructions executed by the central processing means;

keypad input means for inputting commands to the central processing means;

display means, responsive to the central processing means, for displaying characters;

serial communcation interface means for converting parallel data from the central processing means to serial data and serial data to parallel data input to the central processing means;

parallel communication interface means interfacing the central processing means to the computer peripheral for parallel data communication;

the serial and parallel communication inteface means operating at different voltage levels;

connecto means including a plurality of contacts for releasable connection to the data communication capable attached to a computer peripheral;

bus means for connecting the central processing means, the memory means, the keypad input means, the display means, the serial communication interface means, and the parallel communication interface means in data communication; and

serial/parallel switch means, connected to the connector means, the serial communication interface means and the parallel communication interface means, for selectively connecting the serial communication interface means and the parallel communication interface means to the connector means for one of serial and parallel data communication, respectively, between the central processing means and the computer peripheral.

4,964,125

METHOD AND APPARATUS FOR DIAGNOSING FAULTS

Sachol E. Kim, Yorba Linda, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 19, 1988, Ser. No. 234,434
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—20 **35 Claims**

1. An expert system for diagnosing faults in equipment, said system including a computer having a memory for storing diagnostic routines and a user interface that permits communication between the expert system and an operator, said system comprising:

a knowledge base coupled to the computer for storing data that is defined by a plurality of files that characterize the physical, functional and operational relationships of the components and between components of the equipment and information concerning selected operating conditions of the equipment, said files containing data indicative of the following attributes of the equipment: (1) the function of each component, (2) a wire list indicating outputs and interconnection of a component to other components of the equipment, (3) a level jump condition indicator which indicates whether a component may be decomposed into a plurality of other components, (4) a test message representing a stimulus applied to generate outputs that indicates whether a component is faulty, and (5) a listing of normal operating state values for a component indicating when that component is not faulty when the stimulus is applied thereto; and

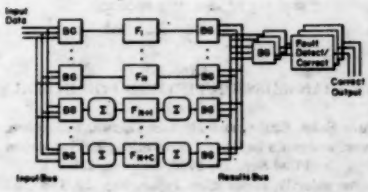
an inference engine that is storable in said memory that interfaces with the knowledge base and the operator by way of the user interface and which comprises recursive diagnostic routines that operate on the data contained in the knowledge base to generate symptom diagnostic rules in response to operator entered symptoms which are indicative of the faults present in the equipment.

4,964,126

FAULT TOLERANT SIGNAL PROCESSING MACHINE AND METHOD

Bruce R. Musicus, Arlington, and William S. Song, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 30, 1988, Ser. No. 251,572
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—36 **13 Claims**



1. Fault-tolerant signal processing machine comprising a plurality of processors each performing identical linear processing operations on its input signal;

at least one checksum processor adapted to perform the same linear processing operation as the plurality of processors;

computing apparatus using inexact arithmetic for forming a linear combination of the input signals to form an input checksum signal and for operating on the input checksum signal with the checksum processor to generate a processed input checksum signal;

computing apparatus using inexact arithmetic for forming the same linear combination of the outputs of the plurality of processors to produce an output checksum signal;

computing apparatus using inexact arithmetic for comparing the output checksum signal with the processed input checksum signal to produce an error syndrome; and

computing apparatus for generating a generalized likelihood ratio test from the error syndrome for assessing a likeliest failure hypothesis.

4,964,127

DATA VALIDITY CHECKING MEANS

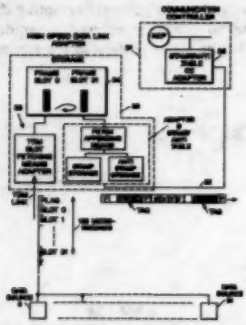
Jean Calvignac, LaGaude; Michel Dauphin; Raymond Lenoir, both of Vence, and Jean-Louis Picard, LaColle sur Loup, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1988, Ser. No. 266,961

Claims priority, application European Pat. Off., Nov. 27, 1987, 87480019.6

Int. Cl.[5] G06F 11/10

U.S. Cl. 371—37.1 18 Claims



1. System wherein data are arranged into frames including a data section and a data dependent Frame Check Sequence (FCS), and wherein a so called stamp section is to be appended to said data section including:

means for storing an anti-stamp section made to neutralize the contribution of said stamp section to said FCS; and

means for concatenating said anti-stamp section to said stamp section, whereby a tag is generated; and

appending said tag to said data section.

4,964,128

DATA TRANSMISSION METHOD FOR INTERLEAVED DATA

Yoichiro Sako, Chiba, and Hiroshi Ogawa, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 29, 1988, Ser. No. 250,516

Claims priority, application Japan, Sep. 29, 1987, 62-244996

Int. Cl.[5] G06F 11/10

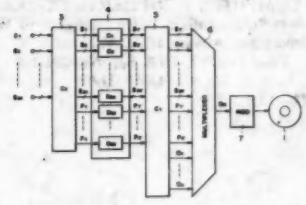
U.S. Cl. 371—39.1 11 Claims

1. A data block transmission method for interleaved data comprising the steps of:

scrambling input data elements forming each data block in the temporal order thereof by an interleaving operation to form interleaved input data elements,

dividing said interleaved input data elements into groups, each group being composed of a prescribed number of said data elements,

generating error correction parity codes and affixing said error correction parity codes to a prescribed number of data elements for transmission on a transmission channel, and



using a prescribed number of dummy data elements arrayed with the input data elements forming said data blocks for generating and affixing the error correction parity codes.

4,964,129

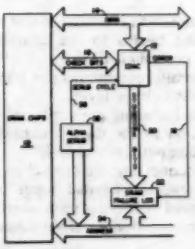
MEMORY CONTROLLER WITH ERROR LOGGING

Raymond D. Bowden, III, Tewksbury; Edward R. Salas, Lowell; Marc E. Sanfacon, Acton, and Jeffrey S. Somers, Lowell, all of Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Dec. 21, 1988, Ser. No. 287,927

Int. Cl.[5] G06F 11/10

U.S. Cl. 371—40.2 17 Claims



1. In a data processing system, a system for logging an error that occurred in a multi-chip memory storage means comprising:

(a) error detecting means for detecting an error, said error detecting means receiving data and check bits associated therewith for generating syndrome bits as a function of said data and of said check bits; and

(b) error logging means operatively connected to said error detecting means for receiving said syndrome bits therefrom, said error logging means determining in which chip said error occurred, said error logging means further comprising scrubbing means for sequentially accessing predetermined physical locations in said multi-chip memory storage means in which errors have been detected by said error detecting means, including address counters for logging said predetermined physical locations in said multi-chip memory storage means in which said errors have occured.

4,964,130

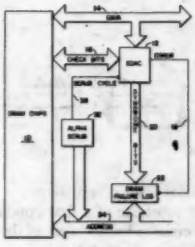
SYSTEM FOR DETERMINING STATUS OF ERRORS IN A MEMORY SUBSYSTEM

Raymond D. Bowden, III, Tewksbury; Edward R. Salas, Lowell; Marc E. Sanfacon, Acton, and Jeffrey S. Somers, Lowell, all of Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Dec. 21, 1988, Ser. No. 287,928

Int. Cl.[5] G06F 11/10

U.S. Cl. 371—40.2 12 Claims



1. In a data processing system, a subsystem for determining the status of an error that occurred in a multi-chip memory storage means comprising:

(a) error detecting means for detecting an error, said error detecting means receiving data and check bits associated therewith for generating syndrome bits as a function of said data and of said check bits; and

(b) error logging means for determining the status of all detected errors operatively connected to said error detecting means for receiving said syndrome bits therefrom, said error logging means further comprising monitoring means for distinguishing between hard errors and soft errors, and scrubbing means for sequentially accessing predetermined physical locations in said multi-chip memory storage means in which errors have been detected, including incrementing address counters for logging said predetermined physical locations in said multi-chip memory storage means in which said errors have occurred.

4,964,131

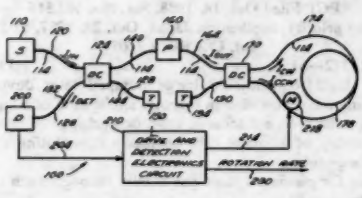
BROADBAND OPTICAL FIBER LASER

Karen Liu, Montclair, N.J.; Byoung Y. Kim, Menlo Park, Calif.; Michel J. F. Digonnet, Palo Alto, Calif.; Kenneth A. Fesler, Sunnyvale, Calif., and Herbert J. Shaw, Stanford, Calif., assignors to The Board of Trustees of the Leland Standford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 287,573, Dec. 16, 1988, abandoned, which is a continuation of Ser. No. 176,739, Apr. 1, 1988, abandoned. This application Mar. 9, 1989, Ser. No. 319,241

Int. Cl.[5] H01S 3/30

U.S. Cl. 372—6 48 Claims



1. A resonant laser, comprising:

a resonant cavity having a lasing medium which emits light in an emission spectrum in response to application of pump energy to said lasing medium, said emission spectrum having a first bandwidth at a first wavelength of said pump energy and a second bandwidth at a second wavelength of said pump energy, said second bandwidth at least 50 percent greater than said first bandwidth, said resonant cavity being sized to support at least thousands of longitudinal modes, at least some of said modes corresponding to wavelengths outside said first bandwidth, but within said second bandwidth; and

a source of pump energy having said second wavelength.

4,964,132

LASER ARRANGEMENT WITH FREQUENCY STABILIZED AND INTENSITY STABILIZED LASER EMISSION

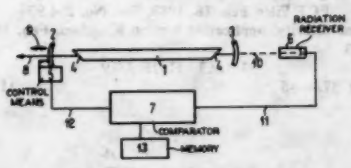
Georg Fischer, Gilching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 7, 1989, Ser. No. 362,479

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1988, 3819333

Int. Cl.[5] H01S 3/13

U.S. Cl. 372—32 8 Claims



1. a laser arrangement having high intensity stability and frequency stability of a laser emission, comprising:

an optical resonator means for exciting two longitudinal modes of laser operation;

a polarization means in said optical resonator for polarizing said two longitudinal modes of laser operation;

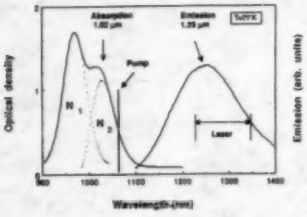
a control means for controlling an optical length of said optical resonator; and

means for comparing a first extreme value of an intensity of the laser emission to a rated value in terms of operational sign and level, said means for comprising finding out a second extreme value which observes a prescribed limit value referenced to the first extreme value in terms of operational sign and level so that in two mode operation a coupling of the intensities of the two modes occur and at least one minimum produced as a result thereof appears in the gain curve over the frequency, said control means maintaining said prescribed limit value.

4,964,133
LASERS IN ALKALI HALIDES USING N AND R COLOR-CENTERS

Clifford R. Pollock, Alexandria, Va.; Efstratios T. Georgiou, and Timothy J. Carrig, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Apr. 14, 1989, Ser. No. 338,069
Int. Cl.[5] H01S 3/16
U.S. Cl. 372—42 19 Claims

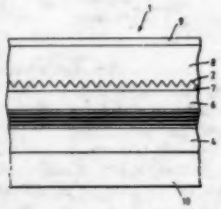


1. A laser material which comprises an alkali-halide crystal having a rocksalt crystallographic structure with N_2 color-center point defects.

4,964,134
SEMICONDUCTOR LASER STRUCTURES

Leslie D. Westbrook, Ipswich, and Michael J. Adams, Suffolk, both of England, assignors to British Telecommunications public limited company, Great Britain

PCT No. PCT/GB88/00101, § 371 Date Oct. 4, 1988, § 102(e) Date Oct. 4, 1988, PCT Pub. No. WO88/06360, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 18, 1988, Ser. No. 254,934
Claims priority, application United Kingdom, Feb. 18, 1987, 8703743
Int. Cl.[5] H01S 3/19
U.S. Cl. 372—45 11 Claims

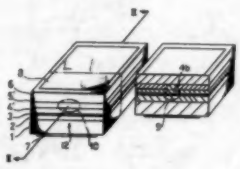


1. A direct band gap semiconductor laser structure having a resonant cavity and electrodes whose emission wavelength is less than its active material band gap equivalent wavelength by an amount such that the emitted photon energy is at least approximately equal to the sum of the band gap energy and the conduction band quasi Fermi level measured from the conduction band edge, the active material of the laser structure being doped p-type to a level at which the laser structure shows positive gain under working conditions.

4,964,135
SEMICONDUCTOR LASER

Shigeru Mitsui; Ryo Hattori, and Tetsuya Yagi, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 20, 1989, Ser. No. 382,220
Claims priority, application Japan, Jul. 22, 1988, 63-184248; Jul. 7, 1989, 1-176877
Int. Cl.[5] H01S 3/19
U.S. Cl. 372—46 10 Claims



1. A semiconductor laser comprising:
a semiconductor substrate of a first conductivity type;
a first cladding semiconductor layer of the first conductivity type disposed on said substrate;
an active semiconductor layer disposed on said first cladding layer;
a second cladding semiconductor layer of a second conductivity type disposed on said active layer including a forward mesa projecting away from said substrate having opposed first and second ends, said laser having opposed first and second facets generally parallel to said first and second ends, respectively, said mesa extending longitudinally between said first and second facets, at least one of said first and second ends being at least partially spaced from the respective first and second facets;
a current blocking semiconductor layer of the first conductivity type disposed on said second cladding layer opposite said substrate burying said forward mesa at the at least one end at least partially spaced from the respective one of said first and second facets;
a contacting semiconductor layer of the second conductivity type disposed on said current blocking layer and on said mesa of said second cladding layer for establishing electrical contact with said second cladding layer and for forming a rectifying junction with said current blocking layer; and
first and second electrodes disposed on said substrate and said contacting layer, respectively.

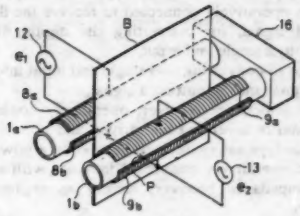
4,964,136
HIGH-FREQUENCY DISCHARGE PUMPED LASER DEVICE

Akira Egawa, Minamitsuru, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP88/01060, § 371 Date May 30, 1989, § 102(e) Date May 30, 1989, PCT Pub. No. WO89/04074, PCT Pub. Date May 5, 1989
PCT Filed Oct. 18, 1988, Ser. No. 363,516
Claims priority, application Japan, Oct. 29, 1987, 62-274405
Int. Cl.[5] H01S 3/03
U.S. Cl. 372—61 3 Claims

1. A high-frequency discharge pumped laser device for producing a laser oscillation through application of a high-frequency voltage to a discharge tube, comprising:
a plurality of adjacent tube segments constituting the discharge tube;
means for passing a laser gas axially through each of said tube segments;
a plurality of high-frequency power supplies for supplying a high-frequency voltage to each one of said tube segments to generate a laser beam output;

a partition wall made of an electroconductive material which is positioned between each of said adjacent tube segments; and



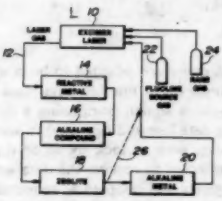
means connecting said partition wall to a ground potential line of a high-frequency circuit to maintain the potential of said partition wall at a constant level.

4,964,137

METHOD OF REFINING RARE GAS FLUORIDE EXCIMER LASER GAS

Minoru Aramaki, Tokyo; Shinsuke Nakagawa, Ube; Hisaji Nakano, Ube; Hiroshi Ichimura, Ube, and Masahiro Tainaka, Ube, all of Japan, assignors to Central Glass Company, Limited

Filed Jan. 18, 1990, Ser. No. 466,930
Claims priority, application Japan, Jan. 30, 1989, 64-120284
Int. Cl.[5] G01S *3/22*
U.S. Cl. 372—59 **8 Claims**



1. A method of refining a laser gas which is used in an excimer laser and comprises at least one rare gas, a fluorine source gas and impurities possibly including CF_4, the method comprising the steps of:

(a) bringing the laser gas into contact with at least one metal having high reactivity with said fluorine source gas to thereby convert the fluorine source gas to at least one metal fluoride;

(b) after step (a), bringing the remaining portion of the laser gas into contact with at least one solid alkaline compound selected from alkali metal compounds and alkaline earth metal compounds to thereby convert most of fluorides in the gas into solid fluorides;

(c) after step (b), bringing the remaining portion of the laser gas into contact with zeolite to thereby remove most of remaining impurities by adsorption; and

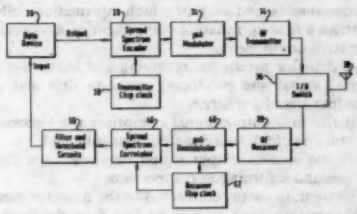
(d) after step (c), bringing the remaining portion of the laser gas into contact with at least one metal selected from the group consisting of alkali metals and alkaline earth metals at an elevated temperature to thereby decompose CF_4 to form a solid metal fluoride and carbon.

4,964,138

DIFFERENTIAL CORRELATOR FOR SPREAD SPECTRUM COMMUNICATION SYSTEM

Greg A. Nease, East Windsor, N.J., and Peter K. Cripps, New Hope, Pa., assignors to Agilis Corporation, Mountain View, Calif.

Filed Nov. 15, 1988, Ser. No. 271,614
Int. Cl.[5] H04L *1/02*
U.S. Cl. 375—1 **9 Claims**



1. In a spread spectrum communication system including a spread spectrum signal having a spreading code sequence differentially encoded in accordance with an input data signal, a data correlator comprising:

an input terminal for receiving said spread spectrum signal;

an output terminal;

differential decoding means, coupled to said input terminal for determining whether at least one chip of the presently received spread spectrum spreading code sequence at said input terminal and at least one chip of a previously received spread spectrum spreading code sequence are substantially equal;

said differential decoding means further providing a first logic level output at said output terminal when said chip of said presently received spread spectrum spreading code sequence and said chip of said previously received spread spectrum spreading code sequence are substantially equal; and

said differential decoding means further providing a second logic level output at said output terminal when said chip of said presently received spread spectrum spreading code sequence and of said chip of

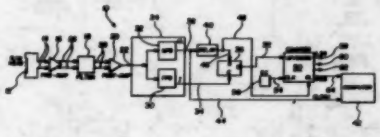
said previously received spread spectrum spreading code sequence are substantially not equal.

4,964,139

MULTI-PURPOSE CIRCUIT FOR DECODING BINARY INFORMATION

Michael L. Wash, Pittsford; Fernando G. Silva, Rochester, and Thomas J. Quattrini, Batavia, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 27, 1989, Ser. No. 344,773
Int. Cl.[5] H03K *7/06*
U.S. Cl. 375—23 **4 Claims**



1. An electrical circuit suitable for decoding in real time binary data comprising first and second information; which data has been encoded into an encoded signal, the encoded signal comprising:

(i) a succession of information-cells, each of which information-cells is demarcated by a pair of unique clock transi-

tions capable of ocurring at variable time intervals and thereby define information-cells of varying time duration; and wherein

(ii) each information-cell is dedicated to encoding either a first information or a second information; the electrical circuit comprising:

(a) a reading means for reading the encoded signal and producing a read signal which corresponds to the encoded signal, so that the read signal comprises

a succession of information-cells, each of which information-cells comprises a unique pair of clock transition components, and each of which information-cells comprises a first information component or a second information component;

(b) a detector means for receiving and interrogating the read signal and producing separate first and second output signals, wherein

(i) the first output signal comprises the succession of unique clock transition components, and

(ii) the second output signal comprises the first and second information components;

(c) a counting means connected to the detector means for

(i) counting, by a predefined first formula, from a first clock transition component in the first output signal until the advent of an information component in the second output signal; and

(ii) then counting by a predefined second formula, from the advent of the information component in the second output signal until the advent of a second clock transition component in the first output signal; and

(iii) with the proviso that if there is no identifiable information component between subsequent clock transition components, then the counting between subsequent clock transition components is in accordance with the first formula; and

(d) a computing means receiving inputs from the detector means and the counting means, for

(i) identifying the succession of information-cells, and

(ii) signifying each identified information-cell as being dedicated to either a first or second information, the signification based on a known relationship between the first and second formulas and the value of only a most significant bit generated by the counting means (c).

4,964,140
DIGITAL DIFFERENTIAL SIGNAL TRANSMISSION APPARATUS

Mikio Yoneyura, Hachioji, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

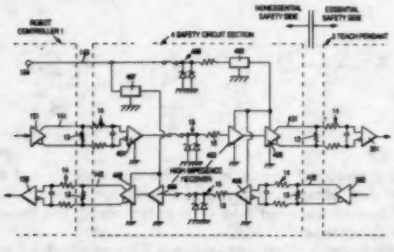
PCT No. PCT/JP88/00688, § 371 Date Feb. 7, 1989, § 102(e) Date Feb. 7, 1989, PCT Pub. No. WO89/00367, PCT Pub. Date Jan. 12, 1989

PCT Filed Jul. 8, 1988, Ser. No. 310,719

Claims priority, application Japan, Jul. 8, 1987, 62-170355

Int. Cl.[5] H04B *3/00*

U.S. Cl. 375—36 **4 Claims**



1. A digital differential signal transmission apparatus provided in a transmission line for transmitting a differential signal to and receiving a differential signal from a device requiring an explosion-proof structure, a shunt diode-type safety device being inserted to provide the transmission line with an essential safe explosion-proof structure, the apparatus comprising:

a receiver, operatively connected to receive the digital differential signal, for converting the digital differential signal into a single end input;

a driver for re-converting said single end input into a differential signal and outputting a signal;

high-input impedance receiver, operatively connected between said receiver and said driver; and

shunt diode-type safety devices, inserted in a power supply line and operatively connected in series with said high-input impedance receiver, having an explosion-proof structure.

4,964,141
SERIAL DATA PROCESSOR CAPABLE OF TRANSFERRING DATA AT A HIGH SPEED

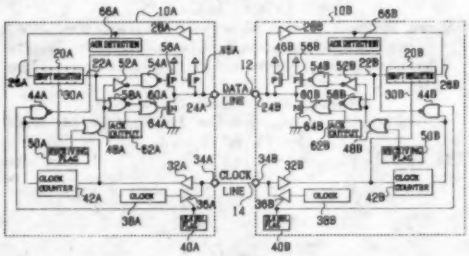
Osamu Matsushima, and Yukio Machashi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 15, 1988, Ser. No. 182,006

Claims priority, application Japan, Apr. 15, 1987, 62-93662

Int. Cl.[5] H04L *7/04*

U.S. Cl. 375—106 **18 Claims**



1. A serial data processor adapted to be coupled to a single data line and a single clock line for serial data transfer in synchronism with a clock signal, comprising a shift register coupled to the single data line and operated to serially output the data in synchronism with a clock signal on the clock line, an output buffer connected to receive the data serially outputted from the shift register and coupled to sequentially output the received data to the data line, the output buffer including a push-pull driver having an output connected to the data line and an input driven by the data serially outputted from the shift register, count means coupled to receive the clock signal on the clock line so as to maintain the push-pull driver in an operable condition until the count value reaches a predetermined value and to bring the output of the push-pull driver into a floating condition after the count value reaches a predetermined value, and data line control means coupled to the data line and controlled by the count means to bring the data line to a predetermined logic level after the count value of the count means reaches the predetermined value.

4,964,142
RECEIVER SYNCHRONIZATION IN ENCODER/DECODER

Kadiresan Annamalai, 343 Donahe Dr., Milpitas, Calif. 95035

Filed Jul. 15, 1987, Ser. No. 72,955

Int. Cl.[5] H04L *7/04*

U.S. Cl. 375—118 **6 Claims**

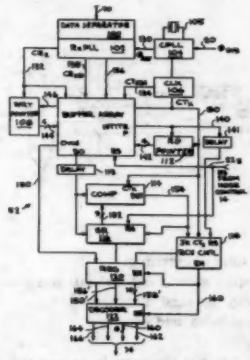
1. A method of synchronizing the decoding of packets of symbols stored in a n-bit register, said symbols serially received from a network and serially stored in an elastic buffer, said

elastic buffer being responsive to a buffer reset signal and including a read pointer means, coupled to said elastic buffer, for determining a buffer read location of signals to be serially read from said elastic buffer, said elastic buffer, responsive to said buffer reset signal, providing a read pointer initialization signal to said read pointer means to initialize said read pointer means in response to said buffer reset signal, said elastic buffer and said read pointer means being responsive to a source of clock signals having a predetermined period, said method comprising the steps of:

(a) generating a signal from said read pointer initialization signal;

(b) delaying said generating signal for a predetermined time period;

(c) generating a synchronization signal during a clock period;



(d) detecting a predetermined start-of-packet delimiter upon serial reception of signals from said elastic buffer, delayed by a first predetermined number of said clock periods m, said packet delimiter comprising signals received over a second predetermined number of said clock periods n;

(e) generating said synchronization signal during the next clock period following said detection at step (d) and at every second predetermined number of clock periods thereafter;

(f) loading into said n-bit register, in parallel, synchronized by said signal generated at step (e), signals, representing said symbols, serially read from said elastic buffer, delayed by said m clock periods, during the second predetermined number of clock periods preceding generation of said signal generated by step (e).

4,964,143

EPROM ELEMENT EMPLOYING SELF-ALIGNING PROCESS

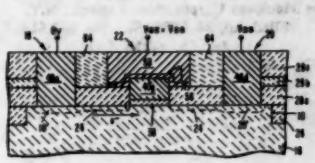
Jacob D. Haskell, Palo Alto, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 162,822, Mar. 2, 1988, abandoned. This application Nov. 23, 1988, Ser. No. 276,278

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—23.5 **9 Claims**

1. An EPROM element (66) comprising a MOS transistor formed on a substrate (16) and comprising source (18) and drain (20) regions contacted by source (46*s*) and drain (46*d*) contacts, respectively, and a gate region (22) therebetween comprising a floating gate (40*g*) and a control gate (58), said control gate formed above said floating gate, said floating and control gates capacitively coupled together and separated from each other by a first dielectric (56) and from said source and drain contacts by a second dielectric (64), characterized by (a) alignment of said source and drain contacts to said floating gate, (b) said source and drain contacts and said control gate comprising conducting plugs, disposed in openings formed in insulating material (28) formed on said substrate, said openings defined by substantially perpendicular walls, said plugs terminating in upper connecting surfaces to form a coplanar surface



in an area above said substrate and substantially parallel to said substrate for contacting by planar interconnects, and (c) said source and drain plugs and said floating gate having a substantially identical width parallel to said substrate.

4,964,144

COUNTER FOR ELECTRIC SWITCH DEVICE

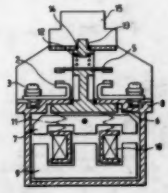
Kazumi Uchida, and Kotaro Tomioka, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Aug. 8, 1989, Ser. No. 390,911

Claims priority, application Japan, Aug. 11, 1988, 63-106194[U]; Aug. 11, 1988, 63-106195[U]; Jun. 16, 1989, 1-70439[U]

Int. Cl.[5] G06M *3/02*

U.S. Cl. 377—15 **4 Claims**



1. An electric switch device, comprising:

a contact spring

a movable contact element;

a movable contact element-supporting member having a protrusion thereof for supporting said movable contact element through said contact spring;

a fixed contact element disposed in opposed relation to said movable contact element, said movable and fixed contact elements being moved toward and away from each other to effect closing and opening operations;

a casing for containing said movable and fixed contact elements therein, said casing being provided with a hole through which said protrusion of said movable contact element-supporting member is projected outwardly according the movement of said movable contact element-supporting member, and

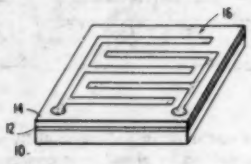
a counter mounted on said casing for counting the frequency of projection of said protrusion of said movable contact element-supporting member through said hole.

4,964,145

SYSTEM FOR MAGNIFICATION CORRECTION OF CONDUCTIVE X-RAY LITHOGRAPHY MASK SUBSTRATES

Juan R. Maldonado, Chappaqua, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 24, 1989, Ser. No. 383,519
Int. Cl.[5] G21K *5/00*
U.S. Cl. 378—35 **20 Claims**



1. A thin film structure for correcting magnification errors in an X-ray lithography structure comprising:

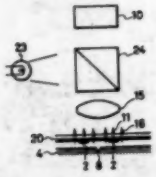
a conductive substrate a low dielectric constant thin film deposited on one surface of said substrate, a piezoelectric film deposited on said low dielectric constant thin film, and an electrode array positioned on said piezoelectric film to provide a relatively uniform electric field across the electrode array in said piezoelectric film.

4,964,146

PATTERN TRANSISTOR MASK AND METHOD OF USING THE SAME

Shinji Kuniyoshi, and Takeshi Kumura, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 7,268,202, Nov. 7, 1988, abandoned, which is a continuation of Ser. No. 6,888,862, Jul. 23, 1986, abandoned. This application Mar. 15, 1989, Ser. No. 324,977
Claims priority, application Japan, Jul. 31, 1985, 60-167560
Int. Cl.[5] G21K *5/00*
U.S. Cl. 378—35 **9 Claims**



1. A pattern transfer mask comprising:

substrate means substantially transmissible to radioactive rays which penetrate said substrate means and form a pattern of said pattern transfer mask on a wafer and substantially transmissible to illumination light which is incapable of forming a pattern on said wafer for enabling alignment with said wafer having a step mark, and

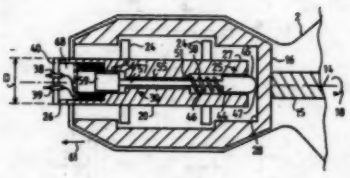
absorber means provided face to face with said wafer on a first side of said substrate means for absorbing said radioactive rays and for enabling alignment with said wafer, said substrate means having a predetermined refractive index and thickness so that when alignment with said wafer is effected by said illumination light incident to a second side of said substrate means opposite said first side of said substrate means, the resultant intensity of the illumination light reflected from said absorber means and the second side of said substrate means is smaller than that of the illumination light reflected from said wafer without passing through said absorber means so as to enable detection of relative position between said absorber means and said step mark of said wafer by detecting steps of the intensities of the illumination light reflected from said wafer, said absorber means and said step mark, respectively.

4,964,147

ROTATING ANODE X-RAY TUBE COMPRISING ANODIC CURRENT FLOW DEVICE

Michel Laurent, Plaisir; Pierre Nouailhagnet, Issy les Moulineaux, and Claude Mathieu, Versailles, all of France, assignors to General Electric CGR SA, Paris, France

Filed Jan. 17, 1989, Ser. No. 297,686
Claims priority, application France, Jan. 18, 1988, 88 00503
Int. Cl.[5] H01J *35/10*
U.S. Cl. 378—125 **4 Claims**



1. An X-ray tube comprising:

an anode rotating about a defined axis and permanently fixed in position in the axial direction;

a rotor integral with said anode;

a cathode;

wherein said rotor is electrically connected to said anode and wherein said tube is powered by a high voltage having a negative polarity applied to said cathode and a positive polarity applied to a anode in a switchable manner via said friction contact device, said friction contact device being positioned inside said rotor and connected to said high voltage positive polarity, said contact device establishing switchable coupling with said rotor and said rotating anode in order to provide switchable electric contact for outflowing of tube anodic current, said tube further comprising a switching means for switching said contact between said rotor and said friction contact device in order to establish or cut-off said electrical contact for said outflowing of tube anodic current independent of the rotation of said anode.

4,964,148

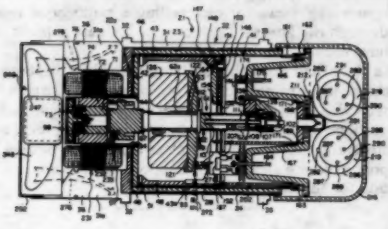
AIR COOLED METAL CERAMIC X-RAY TUBE CONSTRUCTION

Heinrich F. Klostermann, Menlo Park, and Martin Braun, San Jose, both of Calif., assignors to Meicor, Inc., Clearwater, Fla.

Continuation-in-part of Ser. No. 126,842, Nov. 30, 1987. This application Nov. 21, 1988, Ser. No. 273,553
Int. Cl.[5] H01J *35/10, 35/26*
U.S. Cl. 378—127 **36 Claims**

32. In an x-ray tube construction, a housing, a shaft having an exterior surface and front and rear ends, an anode plate carried by the shaft, front and rear bearing means disposed on opposite sides of the anode plate for rotatably mounting the front and rear ends of the shaft in the housing, motor drive means coupled to the shaft for rotating the shaft and the anode plate, a cathode for supplying electrons, voltage means connected to the anode plate and to the cathode for accelerating the electrons so the electrons impinge upon the anode plate to create x-rays, a thick-walled metal heat cage disposed in the housing between the front and rear bearing means and substantially enclosing the anode plate, a metal evacuated envelope

disposed within the housing and sealingly engaging the heat cage, said heat cage being comprised of two parts and means



forming a mechanical bond between said two parts to provide heat transfer between the two parts.

4,964,149

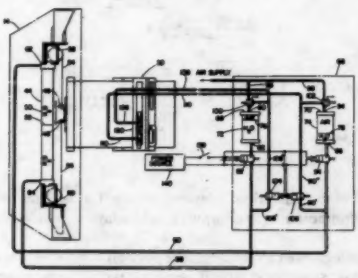
FLUID CONTROLLED COUNTERBALANCE AND POWER-ASSIST FOR RADIATION IMAGING

Glenn A. Little, Chagrin Falls, Ohio, assignor to Picker International, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 12,179, Feb. 9, 1987, abandoned. This application May 6, 1988, Ser. No. 190,833

Int. Cl.[5] G03B *42/02*

U.S. Cl. 378—167 19 Claims



18. In a diagnostic imaging system comprising a penetrating radiation source, an image detector, and a fluid powered power-assist system, said fluid powered power-assist system comprising:

(a) a first member;

(b) a second member movably mounted to said first member;

(c) a slave actuator comprising a cylinder having a first end and a second end and a reciprocating piston having a first side and a second side coupled between said first and second members, said cylinder having a fluid coupling port located at each of said first and second ends of said cylinder for coupling working fluid to each of said first and second sides of said piston;

(d) control means for producing first and second pressure signals in response to operator exerted force upon said control means, such that said first and second pressure signals are simultaneously proportional to the operator exerted force; and

(e) master power control means receiving said first and second pressure signals and further connected to the fluid coupling ports of said slave actuator for creating a working fluid pressure differential across the reciprocating piston in response to said first and second pressure signals.

4,964,150

DIAGNOSTIC X-RAY EXAMINATION APPARATUS

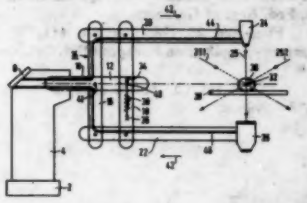
Antonius G. Van Der AA, and Theodorus J. M. Van Genechten, both of Eindoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 29, 1989, Ser. No. 459,049

Claims priority, application Netherlands, Jan. 6, 1989, 8900028

Int. Cl.[5] H05G *1/02*

U.S. Cl. 378—197 6 Claims



1. An X-ray examination apparatus, comprising a supporting shaft and a holder which comprises two side arms and two transverse arms which are pivotably interconnected so as to form a parallelogram, the transverse arms intersecting the supporting shaft and being connected to the supporting shaft so as to be rotatable about a respective rotary shaft extending transversely of the supporting shaft, an X-ray source and an X-ray detector being secured to opposite ends of the side arms so as to face one another, characterized in that an auxiliary force element is included secured to at least one of said arms for storing potential energy upon rotation of the transverse arms in a first direction of rotation and for delivering the potential energy to said at least one arm upon rotation of the transverse arms in a second direction of rotation.

4,964,151

ISOCENTRIC RADIOLOGY STAND

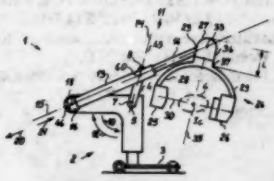
Jacques Trotel, Palaiseau, France, assignor to General Electric CGR SA, Paris, France

Filed Dec. 28, 1988, Ser. No. 291,154

Claims priority, application France, Dec. 29, 1987, 87 18300

Int. Cl.[5] H05G *1/02*

U.S. Cl. 378—198 7 Claims



1. A radiology stand, which comprises:

a base;

a binding clip having first and second arms bearing, respectively, an X-ray source and a receiver, said X-ray source and said receiver defining with respect to one another an image chain axis passing through an isocenter;

a moving foot which connects said binding clip to said base and which includes means centered on said isocenter for generating circular movement of said binding clip;

a telescopic column connected to said moving foot;

a connecting rod having a first end attached to said base and a second end connected to said telescopic column, said connecting rod being rotatable with respect to said base about an axis of rotation located at said first end; and

means for generating circular movement of said moving foot by rotation of said connecting rod about said axis of rotation.

4,964,152

PORTABLE X-RAY DIAGNOSTICS APPARATUS HAVING A HEIGHT-ADJUSTABLE COLUMN

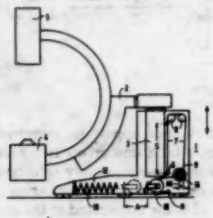
Karlheinz Kaul, Uttenreuth; Edmund Saffer, Eggolsheim, and Hans-Christian Bock, Uttenreuth, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 25, 1989, Ser. No. 411,738

Claims priority, application European Pat. Off., Oct. 13, 1988, 88117043.5

Int. Cl.[5] H05G 1/02

U.S. Cl. 378—198 **6 Claims**



1. A mobile x-ray diagnostics apparatus comprising:
a carriage having a vertical portion and a horizontal base;
a height-adjustable column slidably received in said vertical portion of said carriage and having an x-radiator and a radiation receiver mounted thereon;
a cable disposed inside said carriage and having one end attached to a lower region of said column in said carriage;
a plurality of deflection elements in said carriage around which said cable is entrained, said cable having an opposite end attached inside said carriage; and
a horizontally tensed spring disposed and anchored in said base of said carriage and attached to one of said deflection elements for exerting a weight-compensating force on said column via said cable.

4,964,153

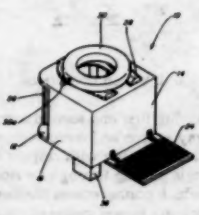
PATIENT SUPPORT STRUCTURE POR PERFORMING DEFECOGRAPHY STUDIES

Donnie A. Lassiter, Greenville, N.C., assignor to Pitt County Memorial Hospital, Greenville, N.C.

Filed Jan. 23, 1989, Ser. No. 299,453

Int. Cl.[5] H05G 1/00

U.S. Cl. 378—208 **4 Claims**



1. A radiological support structure for supporting a patient in a conventional defecating position for performing defecography studies comprising:
(a) base support structure having a top with a central opening therein, a surrounding side wall structure, and an internal open area defined below the top and within the surrounding side wall structure;
(b) an access opening formed in the base support structure comprising mean for channelling a radiopaque medium through the internal open area of the base support structure; and
(c) a clear fluid filled annular buttock support disposed over the central opening of the top of the base structure for receiving and supporting the anus of the patient such that portions of the patient's rectum lie within the support structure and wherein the clear fluid filled buttock support structure elevates and supports the rectum in a position for simulating defecation.

4,964,154

COMMUNICATION ADAPTER DEVICE FOR USE WITH A FACSIMILE DEVICE COMBINED WITH A COMPUTER

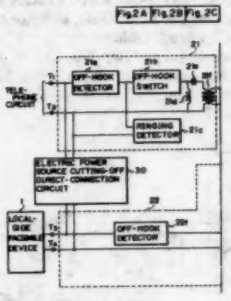
Susumu Shimotono, Hatano, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 13, 1989, Ser. No. 296,700

Claims priority, application Japan, Jan. 14, 1988, 63-004831

Int. Cl.[5] H04M 11/00

U.S. Cl. 379—100 **19 Claims**



1. A communication adapter device for use in facsimile device combined with computer, said adapter device comprising:
(a) a telephone circuit interface portion connected through a public telephone circuit network with a remote-side facsimile device which is a communication exchanging opponent party,
(b) a facsimile device interface portion connected with the circuit terminal of a local-side facsimile,
(c) electricity supplying means for supplying electricity to said circuit terminal side of said local-side facsimile device in order to create an electric condition same as that of said public telephone circuit,
(d) a digital interface portion connected with a digital signal interface terminal of a computer,
(e) first image information transmitting means for transmitting said image information between said remote-side facsimile device and said computer,
(f) second image information transmitting means for transmitting said image information between said local-side facsimile device and said computer,
(g) third image information transmitting means for transmitting said image information between said remote-side facsimile device and said local-side facsimile device, and
(h) control means for selecting one of said first, second and third image information transmitting means and thereby executing a communication by facsimile, wherein said communication adapter device, said local-side facsimile device and said computer are mutually connected with each other by means of digital telephone circuit,
wherein said communication adapter device is changed over

and connected with said computer by use of communicated signal transmitted from said local-side facsimile device,

wherein, at the time of dialing from computer side, said computer is changed over and connected with either one of said public telephone circuit and said local-side facsimile device in accordance with a computer program or operator's manipulation,

and wherein, at the time of receiving signals from said public telephone circuit, whether said computer responds to said received signals or said local-side facsimile device responds to is previously set by said computer.

4,964,155

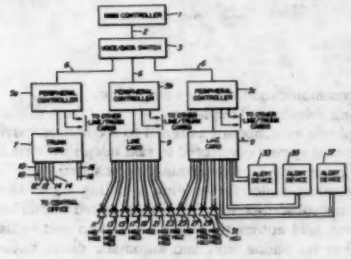
PROGRAMMABLE THRESHOLD ALERT

Debbie Pinard, Ontario, Canada, assignor to Mitel Corporation, Ontario, Canada

Filed Mar. 14, 1989, Ser. No. 323,374

Int. Cl.[5] H04M *3/50*

U.S. Cl. 379—136 **13 Claims**



1. In a communication system comprised of a predetermined number of call answer stations for receiving incoming calls, an incoming call threshold alert system, comprised of:

(a) means for detecting the number of said incoming calls waiting to be answered and the number of free call answer stations, and in response generating a level value representing the percentage of said number of calls waiting to be answered relative to said number of free call answer stations,

(b) means for receiving and comparing said level value to one or more threshold values and in response generating an output signal for indicating magnitude of said level value relative to said one or more threshold values, thereby providing an indication of said number of calls waiting relative to said number of free stations.

4,964,156

CELLULAR TELEPHONE UNIT CAPABLE OF AUTOMATIC INTERACTION WITH AUDIO SERVICES

Kevin B. Blair, Spring, Tex., assignor to GTE Mobilnet Incorporated, Houston, Tex.

Continuation of Ser. No. 223,863, Jul. 25, 1988, abandoned. This application Dec. 1, 1989, Ser. No. 443,836

Int. Cl.[5] H04M *1/27, 1/66, 3/50, 11/00*

U.S. Cl. 379—189 **5 Claims**

1. A method of operating a telephone unit having a keypad, a memory programmable by a user to store predetermined information including numbers, commands and pause commands, and control logic means for performing a series of steps including:

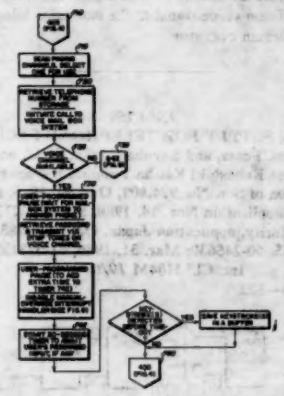
retrieving from said memory in response to an initiating action a stored telephone number for a telephone accessible response system;

automatically sending a signal using said telephone number to originate a call to said response system;

providing a predetermined interval after the call is established for a user to enter a sequence of zero or more characters upon said keypad to create a keypad signal;

monitoring the keypad signal to detect, if entered, a predetermined password sequence;

in responsive to detection of said password sequence, transmitting the password to said telephone accessible response system, and



in responsive to non-entry of said password sequence, interrupting any connection of said telephone unit with said telephone accessible response system, and treating any entered sequence as a possible user command, including an instruction to originate a call to another telephone number represented by an entered sequence.

4,964,157

CONFERENCE SPEECH-CHANNEL FORMING METHOD BASED ON PRIVATE BRANCH EXCHANGE AND ITS CONFERENCE TELEPHONE SYSTEM

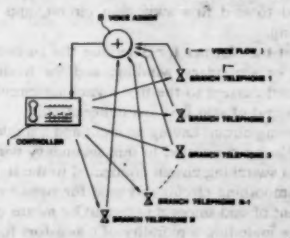
Akihiko Aoshima, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 26, 1989, Ser. No. 457,235

Claims priority, application Japan, Dec. 27, 1988, 63-330705

Int. Cl.[5] H04M *3/56*

U.S. Cl. 379—204 **13 Claims**



1. A conference speech channel forming method based on a private branch exchange in which an extension telephone set to be operated by an operator as a conference chairman is logically connected to a plurality of extension telephone sets to be operated by a plurality of operators as conference participators through said private branch exchange to establish conference speech channels between said extension telephone sets, said method comprising:

a first step of forming first ones of said conference speech channels to transmit a voice signal from the extension

telephone set of said chairman operator to said plurality of extension telephone sets of said participator operators in parallel therewith; and

a second step of forming second ones of the conference speech channels to add together a plurality of voice signals issued from the plurality of extension telephone sets of the participator operators through a voice adder circuit to generate an addition voice signal and then to transmit said addition voice signal to the extension telephone set of the chairman operator.

4,964,158

POWER SUPPLY FOR TELEPHONE EXCHANGE

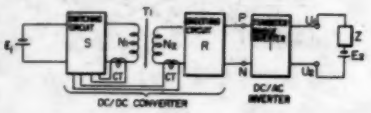
Sadao Okochi, Fussa, and Kazuharu Ishii, Shiki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

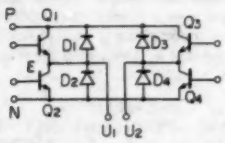
Continuation of Ser. No. 924,809, Oct. 30, 1986, abandoned. This application Nov. 14, 1988, Ser. No. 273,164

Claims priority, application Japan, Oct. 31, 1985, 60-245629; Oct. 31, 1985, 60-245630; Mar. 31, 1986, 61-073155

Int. Cl.[5] H04M *19/00, 3/00*

U.S. Cl. 379—322 **16 Claims**





2. A power supply for a telephone exchange, comprising:

a first switching circuit for receiving and subjecting direct current to high frequency switching by means of a switching element;

a converter transformer having a primary winding connected to said first switching circuit, and a secondary winding;

a current transformer for detecting the current in said primary or secondary winding, and for feeding back the detected current to the first switching circuit to stabilize the output of said first switching circuit;

a smoothing circuit having an input and a single output, said input being connected to said secondary winding;

a second switching circuit connected to the single output of said smoothing circuit and used for switching the output current of said smoothing circuit by means of a transistor bridge including a plurality of transistors for being alternately turned on, wherein said second switching circuit has four transistors for forming a full bridge circuit;

a direct-current bypassing diode connected between the input and output terminals of each of said transistors for returning reactive power to said secondary winding;

a driving signal generator circuit for generating a driving signal for setting timing to prevent the period during which each of said transistors is turned on from overlapping the period during which another of each of said transistors is subsequently turned on; and

a driving circuit for driving each of said transistors in accordance with said driving signal.

4,964,159

COMMUNICATION SYSTEM HAVING AN AUTOMATIC DIALER

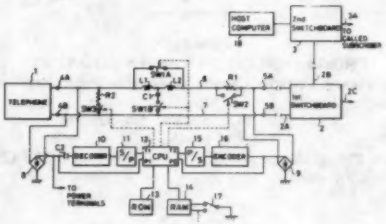
Masayoshi Son, Tokyo, Japan, assignor to Datanet Corp., Tokyo, Japan

Continuation of Ser. No. 172,241, Mar. 23, 1988, Pat. No. 4,873,720. This application Aug. 21, 1989, Ser. No. 396,158

The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.

Int. Cl.[5] H04M *1/27*

U.S. Cl. 379—356 **2 Claims**



1. A communication system comprising:

a calling subscriber telephone;

a telephone switchboard assigned to a common carrier;

an external system connected to said telephone switchboard for generating a predetermined tone signal;

an automatic dialer for sending a calling signal from said calling subscriber telephone to a called subscriber telephone, said automatic dialer coupled to said calling subscriber telephone, and said automatic dialer having first memory means for storing dialed information provided from said calling subscriber telephone, second memory means for storing predetermined additional information corresponding to each of common carriers, third memory means for storing specific discriminating information corresponding to a portion of said dialed information stored in said first memory means, read means for reading out a portion of said dialed information from said first memory means, access means for reading out said specific discriminating information stored in said third memory means in response to output data of said read means, transmitting means for transmitting said predetermined additional information stored in said second memory means together with said dialed information stored in said first memory means to said telephone switchboard when said specific discriminating information stored in said third memory is accessed, and writing means for controlling a writing information of said third memory means on the basis of said tone signal provided from said external system via said telephone switchboard; and

a communication circuit connected between said telephone switchboard and said automatic dialer.

4,964,160

PROTECTOR DEVICE

Roy F. Traube, Colchester, and Michael J. Danks, Birmingham, both of England, assignors to British Telecommunications public limited company, Great Britain

Filed Jan. 31, 1989, Ser. No. 304,283

Claims priority, application United Kingdom, Feb. 3, 1988, 8802434

Int. Cl.[5] H02H *9/00*

U.S. Cl. 379—412 **20 Claims**

10. In a telephone exchange having secondary semiconductor protection equipment, the provision of a primary protection module for insertion into location means within the exchange, said primary protection module comprising:

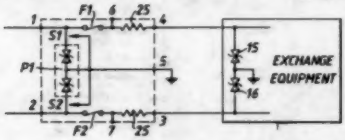
a housing,

a plurality of contacts associated with the housing for connection between a line pair and the exchange,

a voltage sensor including a pair of series-connected solid state semiconductor devices connectable across the line pair via said contacts and operable on receipt of a source of over-voltage to provide a conductive path therefor,

a first fusible current sensor connectable in series with the first line of the pair via the contacts and electrically located between the voltage sensor and the exchange and operable to become open circuit on receipt of a predetermined current,

a second fusible current sensor connectable in series with the second line of the pair via the contacts and electrically



located between the voltage sensor and the exchange and operable to become open circuit on receipt of a predetermined current,

said first and second fusible current sensors each including impedance means in series with a fusible element thereof so as to be electrically located between the fusible element and the exchange, and

heat sensitive means adjacent the voltage sensor operable to electrically bypass the voltage sensor on detection of heating resulting from continuous conduction thereof whereby both extraneous power sources and surges are dealt with by the primary protection module without damage to the secondary protection equipment.

4,964,161

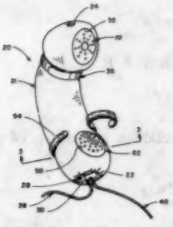
COVER FOR A TELEPHONE HANDSET

Allen R. Trowbridge, Jr., 49 Main St., Kensington, Conn. 06037

Filed Jan. 23, 1990, Ser. No. 468,871

Int. Cl.[5] H04N 1/17; H04R 1/12

U.S. Cl. 379—452 **2 Claims**



1. A cover for a telephone handset comprising:

(A) a monolithic, one-piece flexible body which completely encases a telephone handset, said body including

(1) a speaker end,

(2) an earpiece end,

(3) a handset cord passage located on said speaker end through which a handset cord passes,

(4) an elastic element mounted on said cover in surrounding relation to said handset cord passage,

(5) a speaker filter mounting assembly which includes

(a) a circular speaker-covering hole defined through said body to cover a speaker of the telephone handset,

(b) a speaker-covering hole U-shaped flange having one leg formed by said body adjacent to said speaker-covering hole, a bight section on said one leg and a second leg on said bight section and extending parallel to said one leg, with both legs extending radially inwardly of said speaker-covering hole so that said U-shaped flange opens radially inwardly of said speaker-covering hole, and

(6) an earpiece filer mounting assembly which includes

(a) a circular earpiece-covering hole defined through said body to cover an earpiece of the telephone handset,

(b) an earpiece-covering hole U-shaped flange having a first leg formed by said body adjacent to said earpiece-covering hole, a connecting section on said first leg and an inner leg on said connecting section and extending parallel to said first leg, with both legs extending radially inwardly of said earpiece-covering hole so that said U-shaped flange opens radially inwardly of said earpiece-covering hole;

(B) a filter assembly which includes

(1) a speaker-hole covering filter element removably mounted in said speaker-hole covering U-shaped flange to close and cover said speaker hole, and

(2) an earpiece-hole covering filter element removably mounted in said earpiece-covering hole U-shaped flange to close and cover said earpiece hole; and

(C) a cover closure assembly which includes

(1) a drawstring mounted on said cover speaker end in surrounding relationship with said handset cord passage,

(2) a speaker end strap mounted on said cover near said speaker-covering hole and having hook-and-loop fastener means thereon, and

(3) an earpiece end strap mounted on said cover near said earpiece-covering hole and having hook-and-loop fastener means thereon.

4,964,162

SECURE TELEVISION SIGNAL ENCODING AND DECODING SYSTEM

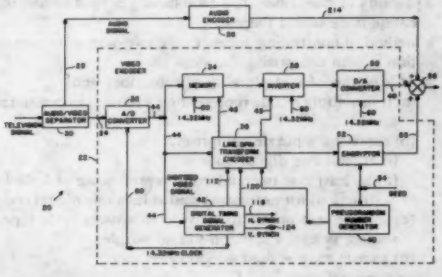
Peter L. McAdam, Los Angeles; Thomas G. Schnerk, Rancho Palos Verdes, and Gregory A. Shreve, Redondo Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 773,488, Sep. 9, 1985, and a continuation-in-part of Ser. No. 831,941, Feb. 24, 1986, Pat. No. 4,827,510, and a continuation-in-part of Ser. No. 829,268, Feb. 14, 1986, abandoned, and a continuation-in-part of Ser. No. 878,735, Jun. 26, 1986, Pat. No. 4,712,240. This application Nov. 21, 1986, Ser. No. 933,668

The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.

Int. Cl.[5] H04N 7/167, 9/45, 7/04

U.S. Cl. 380—14 **88 Claims**



1. A television signal encoding apparatus, comprising:

a video encoder for generating a line-spin scrambled video signal having minimized amplitude gaps, a line-spin scrambled video signal being generated by dividing the active portion of each line of a video signal into at least two segments and then interchanging the segments, an ampli-

tude gap being formed between each of the interchanged segments, the video encoder including:

an analog-to-digital converter for digitizing a video signal; and

means for selectively applying a line spin scrambling transform to each line of the digitized video signal, the line spin scrambling transform being applied to a line of the digitized video signal only if the amplitude gap between each of the interchanged segments is less than or equal to a preselected value, the preselected value being less than 100 IRE units; and

an audio encoder for generating a digitally-encrypted audio signal capable of being transmitted within the bandwidth limitations of a conventional television transmission system, the audio encoder including:

an analog-to-digital converter for digitizing an audio signal;

means for encrypting the digitized audio signal; and

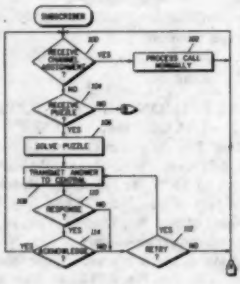
a three-level, partial response modulator for modulating the encrypted audio signal with a three-level, partial response waveform.

4,964,163

METHOD AND APPARATUS FOR CONTROLLING ACCESS TO A COMMUNICATION SYSTEM

Thomas G. Berry, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 4, 1988, Ser. No. 177,559
Int. Cl.[5] H04L 9/00
U.S. Cl. 380—23 **50 Claims**



22. In a two-way communication system having:

a central unit; and

a plurality of subscriber units each having at least an identification code stored therein;

a method of controlling access to the two-way communication system comprising the steps of:

at at least one of said plurality of subscriber units:

(a) transmitting a code representing a request to communicate;

(b) receiving a puzzle comprising:

(i) at least one digital code;

(ii) at least one operand code representing at least instructions for processing said at least one digital code;

(c) solving said puzzle to provide an answer code representing at least a solution to said puzzle;

(d) transmitting at least said answer code

at said central unit:

(a) receiving said code representing a request to communicate;

(b) generating said puzzle;

(c) solving said puzzle to provide an expected answer code;

(d) transmitting said puzzle;

(e) receiving said answer code to provide a received answer code;

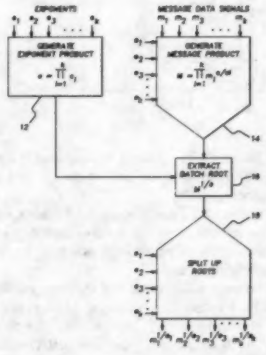
(f) comparing said received answer code and said expected answer code.

4,964,164

RSA COMPUTATION METHOD FOR EFFICIENT BATCH PROCESSING

Amos Fiat, Tel Aviv, Israel, assignor to Algorithmic Research, Ltd., Givitaim, Israel

Filed Aug. 7, 1989, Ser. No. 389,915
Int. Cl.[5] H04K 1/00
U.S. Cl. 380—30 **6 Claims**



1. A method, using a processor, for batch processing a first message-data-signal root as an e1[th] root of a first message-data signal, M1, as $M1^{1/e1}$, and a second message-data-signal root as an e2th root of a second message-data signal, M2, an $M2^{1/e2}$, where e1 and e2 are relatively prime, comprising the steps, using said processor, of:

computing an exponent product, e, by multiplying e1 times e2;

computing a message product, M, wherein

$$M = M1^{(e/e1)}M2^{(e/e2)};$$

computing a batch root, R, wherein

$$R = M^{1/e};$$

computing an euclidean inverse, t, of e2 modulo e1; and computing

$$R^{e2*t}/(M1^{((e2*t-1)}M2^{t})$$

thereby generating the first message-data-signal roots $M1^{(1/e1)}$.

4,964,165

METHOD FOR THE FAST SYNCHRONIZATION OF VOCODERS COUPLED TO ONE ANOTHER BY ENCIPHERING

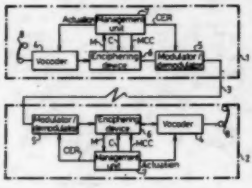
Rémy Journeau, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 12, 1988, Ser. No. 231,563
Claims priority, application France, Aug. 14, 1987, 87 11584
Int. Cl.[5] H04L 9/00
U.S. Cl. 380—48 **10 Claims**

1. A method for fast synchronization of vocoders which are coupled to one another by enciphering and deciphering devices of a type where an enciphering device of a calling vocoder initializes communication by means of a cipher sequence comprising at least one synchronizing sequence, and then transmits decryption data, and wherein digital speech data to

be transmitted are organized in each vocoder in digital frames comprising a defined number of bits, said method comprising the steps of:

synchronizing said digital frames transmitted by said vocoders with an end of a synchronizing sequence in which said enciphering and deciphering devices are synchronized,



transmitting said decryption data for a period equal to a whole multiple of a duration required to transmit said digital frame of said digital speech data, and

synchronizing a receiving vocoder with an end of said transmission of said decryption data.

4,964,166

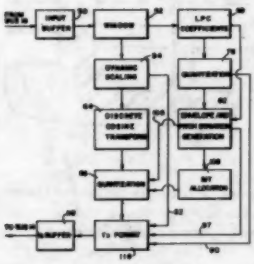
ADAPTIVE TRANSFORM CODER HAVING MINIMAL BIT ALLOCATION PROCESSING

Philip J. Wilson, San Diego, Calif., assignor to Pacific Communication Science, Inc., San Diego, Calif.

Filed May 26, 1988, Ser. No. 199,360

Int. Cl.[5] G10L *3/02*

U.S. Cl. 381—34 **16 Claims**



1. Apparatus for determining formant information of a speech signal in a transform coder, which coder is capable of operation on a signal composed of time domain samples by sequentially segregating groups of samples into blocks, comprising,

extension means for generating a time domain even extension for each of said blocks of time domain samples;

function means for generating an auto-correlation function of said even extension;

derivation means for deriving linear prediction coefficients from said auto-correlation function;

transformation means for performing a Fast Fourier Transform of said coefficients; and

squaring means for mathematically squaring the gain of each coefficient resulting from said fast fourier transform, wherein said formant information for each of said blocks is equal to the collection of each squared gains of said fast fourier transform coefficients for said block.

4,964,167

APPARATUS FOR GENERATING SYNTHESIZED VOICE FROM TEXT

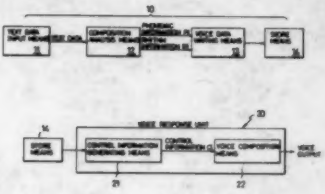
Hiroharu Kunizawa; Noboru Ueji; Akira Yamamura, and Hiroshi Itoyama, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Jul. 6, 1988, Ser. No. 216,210

Claims priority, application Japan, Jul. 15, 1987, 62-176258; Oct. 19, 1987, 62-263298; Oct. 19, 1987, 62-263299

Int. Cl.[5] G10L *5/04*

U.S. Cl. 381—52 **14 Claims**



1. An encoding and composing system for generating voice from text, the system comprising:

(a) a voice encoding unit for text, said voice encoding unit including:

(i) means for obtaining text data as an input for the text,

(ii) a composition analysis means which receives the text data from said text data input means and generates from the text data rhythm information and phonemic information, and

(iii) means connected to receive the prosody and phonemic information for encoding the information as voice data and for writing the encoded voice data;

(b) an encoded voice data storing means including an integrated circuit (IC) card separated from but associatable with said voice encoding unit, said encoding and writing means of said voice encoding unit writing into said storing means the encoded voice data when the storing means is associated with the voice encoding unit; and

(c) a voice response unit separate from said voice encoding unit and associatable with said storing means for composing, when associated, said voice of said text from the stored encoded voice data, said voice response unit including:

(i) a control information generating means for reading from said storing means the encoded voice data to decode therefrom the phonemic and prosody information and generating therefrom control information, and

(ii) a voice composition means responsive to said control information for composing the voice from the control information.

4,964,168

CIRCUIT FOR STORING A SPEECH SIGNAL IN A DIGITAL SPEECH MEMORY

Günter Bierlein, Schwabach, and Helmut Salbaum, Röttenbach, both of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Mar. 10, 1989, Ser. No. 321,610

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1988, 3808298

Int. Cl.[5] G10L *7/02*

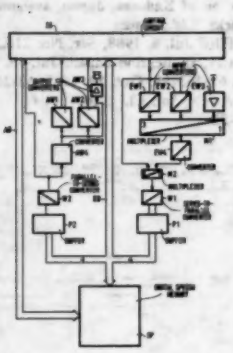
U.S. Cl. 381—36 **7 Claims**

1. A circuit, for storing a speech in a digital speech memory and for reproducing the stored speech signal, comprising:

input converting means for converting an input speech signal encoded in any one of a plurality of different codes into a preferred digital code format;

a digital memory for storing the converted encoded speech signal in the preferred digital code format;

output converting means for converting the stored speech signal into a plurality of speech output signals each encoded in a respective one of the plurality of different codes; and



means for writing the coded speech signal encoded in the preferred digital code into said digitral memory and for reading out the stored speech signal from said digital memory and applying it to said output converting means.

4,964,169

METHOD AND APPARATUS FOR SPEECH CODING

Shigeru Ono, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 697,197, Feb. 1, 1985, abandoned. This application Feb. 15, 1989, Ser. No. 310,464

Claims priority, application Japan, Feb. 2, 1984, 59-17347; May 8, 1984, 59-91252

The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.

Int. Cl.[5] G10L 9/08

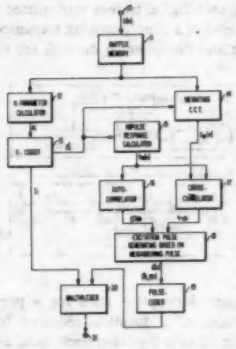
U.S. Cl. 381—40 **8 Claims**

4. A coding apparatus for developing sequentially a new location and a new amplitude of each of excitation pulses representing an excitation signal of a speech band signal based on the pulse locations and amplitudes previously obtained and coding the obtained pulses on a frame basis, said new location being different from the locations of excitation pulses previously obtained, said apparatus comprising:

a first means for setting a new location of a new excitation pulse to be determined at one of a plurality of locations within said frame;

a second means for selecting excitation pulses located within a distance shorter than said frame length from said new location; and

a third means for determining a location and an amplitude of the new excitation pulse to be determined and amplitudes of the selected excitation pulses so as to minimize a difference error between said speech band signal and a reproduction signal reproduced by using said new excitation pulse and at least the selected pulses previously obtained.



4,964,170

HEARING AID

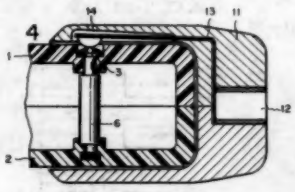
Friedrich Pöhacker, Vienna, Austria, assignor to Viennatone Gesellschaft m.b.H., Vienna, Austria

Filed Mar. 15, 1989, Ser. No. 324,298

Claims priority, application Austria, Mar. 22, 1988, 763/88

Int. Cl.[5] H04R 25/02

U.S. Cl. 381—69 **8 Claims**



1. A hearing aid particularly useful for placement behind an ear of a hard-of-hearing person, which comprises

(a) a multi-part housing containing electric hearing aid components,

(b) detachable fastening elements for mechanically holding the parts of the housing together, and

(c) an audio input connection including at least two of said detachable fastening elements galvanically connected to an audio signal source.

DESIGN PATENTS

GRANTED OCT. 16, 1990

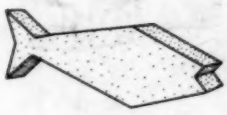
ERRATA

For CLASS	See PATENT NO.
D23-365	311,270

DESIGNS

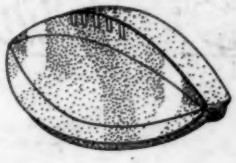
OCTOBER 16, 1990

311,265
FRENCH FRY
George A. Mendenhall, 4242 S. Eagleson Rd., Suite 108, Boise, Id. 83705
Filed Jun. 10, 1987, Ser. No. 60,373
Term of patent 14 years
U.S. Cl. D1—111

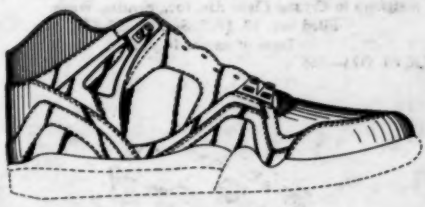


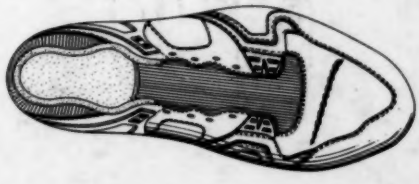
311,266
NOVELTY CAP
Patrick N. Parker, Oklahoma City, Okla., assignor to Bikini Cap Co., Brenham, Tex.
Filed Nov. 20, 1987, Ser. No. 123,666
Term of patent 14 years
U.S. Cl. D2—244

311,267
FOOTBALL FAN'S NOVELTY HAT
Richard K. Pesta, 6324 Boone Ave. North Apt. 3, Brooklyn Park, Minn. 55428
Filed May 21, 1987, Ser. No. 52,358
Term of patent 14 years
U.S. Cl. D2—250



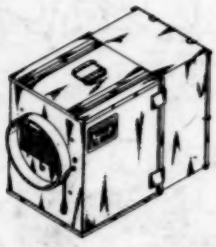
311,268
SHOE UPPER
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg. and Nike International, Ltd., Bermuda, Bermuda
Filed Apr. 25, 1990, Ser. No. 514,357
Term of patent 14 years
U.S. Cl. D2—314



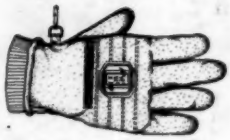


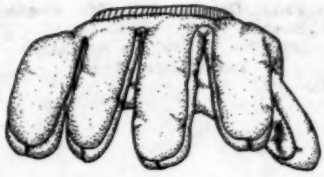
311,269
INSOLE
Kenneth Graham, Wakefield, Mass., and Keaton D. Geer, Exeter, N.H., assignors to Hyde Athletic Industries, Inc., Peabody, Mass.
Filed Sep. 4, 1987, Ser. No. 93,466
Term of patent 14 years
U.S. Cl. D2—318

311,270
AIR FILTRATION UNIT
James J. Savage, and James A. Walsh, both of Seattle, Wash., assignors to Crystal Clear Air, Inc., Seattle, Wash.
Filed Sep. 10, 1987, Ser. No. 95,476
Term of patent 14 years
U.S. Cl. D23—365

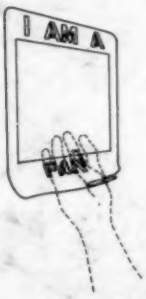


311,271
COMBINED GLOVE AND WATCH
Kevin D. Mann, P.O. Box 247, Sprague, W. Va. 25926
Filed Oct. 30, 1987, Ser. No. 114,395
Term of patent 14 years
U.S. Cl. D2—614





311,272
FAN OR SIMILAR ARTICLE
Johnny R. Simpson, 104 Old Barn La., Rocky Mount, N.C. 27802
Filed Sep. 8, 1986, Ser. No. 905,114
Term of patent 14 years
U.S. Cl. D3—1



311,273
UMBRELLA HANDLE
C. D. Jenkins, Thundersley, United Kingdom, assignor to 'Totes', Incorporated, Loveland, Ohio
Filed Aug. 18, 1989, Ser. No. 395,948
Term of patent 14 years
U.S. Cl. D3—15

311,275
KEY HOLDER
Sumner B. MacDonald, 39 Sea Breeze La., Bristol, R.I. 02809
Filed Jun. 26, 1987, Ser. No. 67,083
Term of patent 14 years
U.S. Cl. D3—61

311,274
COMBINED KEY RING AND CONTAINER
Micha Laury, 91, rue de la Gare, 75 013 Paris, France
Filed Nov. 21, 1988, Ser. No. 273,503
Claims priority, application Int'l Pat. Institute, May 24, 1988, DM/011 007
Term of patent 14 years
U.S. Cl. D3—61

311,276
SHELL FOR LUGGAGE CASE
David E. Workman, Evergreen, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed May 28, 1987, Ser. No. 56,209
Term of patent 14 years
U.S. Cl. D3—76

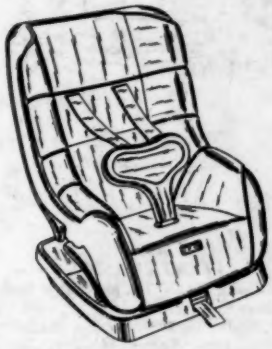
311,277
HOLSTER
Carl J. Cupp, Hawaiian Gardens, Calif., assignor to Pachmayr Ltd., Monrovia, Calif.
Filed Jan. 12, 1988, Ser. No. 143,594
Term of patent 14 years
U.S. Cl. D3—101

311,278
WATER DRIVEN ROTARY BRUSH FOR WASHING WIRE WHEELS OR SIMILAR ARTICLES
Robert A. Swanson, Rte. 9, Box 9, McMinnville, Tenn. 37110
Filed Jun. 2, 1988, Ser. No. 203,347
Term of patent 14 years
U.S. Cl. D4—115

311,279
MINI-DUSTER OR SIMILAR ARTICLE
C. Lin, No. 146, Sec. 1, Chung Shan Road, Chung Chuang Tsun, Hua Tan Hsiang, Chang Hua Hsien, Taiwan
Filed Sep. 3, 1987, Ser. No. 92,712
Term of patent 14 years
U.S. Cl. D4—135

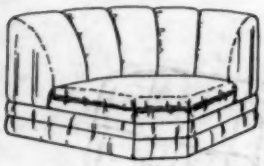
311,280
COMBINED PAINT ROLLER AND APPLICATOR
Ricardo Garcia, 5849 NW. 7th St. #503, Miami, Fla. 33126
Filed May 24, 1988, Ser. No. 200,171
Term of patent 14 years
U.S. Cl. D4—122

311,281
CHILD'S SAFETY SEAT
Paul K. Meeker, Aurora, Ohio, assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.
Filed Aug. 4, 1987, Ser. No. 81,377
Term of patent 14 years
U.S. Cl. D6—333

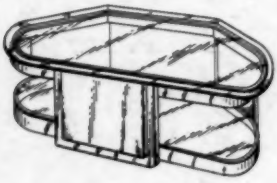


311,282
COMBINED BENCH AND KNEELER
Jonathan Tooley, Andover, England, assignor to The Croydex Company Ltd., Andover, England
Filed Apr. 30, 1987, Ser. No. 44,343
Claims priority, application United Kingdom, Dec. 12, 1986, 103-8761
Term of patent 14 years
U.S. Cl. D6—349

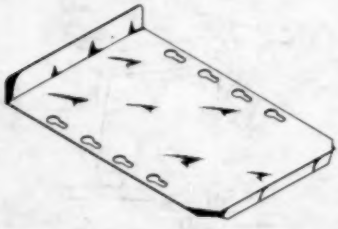
311,283
SEAT
Frank A. Warren, Denville, N.J., assignor to 501 Bencheraft, Inc., Blue Mountain, Miss.
Filed Nov. 12, 1986, Ser. No. 929,764
Term of patent 14 years
U.S. Cl. D6—378



311,284
COCKTAIL TABLE
Herbert B. Goldberg, Skokie, Ill., assignor to Mohasco Upholstered Furniture Corp., Fairfax, Va.
Filed Jul. 19, 1989, Ser. No. 381,515
Term of patent 14 years
U.S. Cl. D6—484



311,285
SHELF
Arthur R. Mastrodicasa, 36 Donnelly Dr., Dover, Mass. 02030
Filed Jun. 21, 1988, Ser. No. 209,474
Term of patent 14 years
U.S. Cl. D6—511



311,286
CHAIR
Wolfgang Muller-Deisig, Natzungen, Fed. Rep. of Germany; David C. Jenkins; Terry D. West, both of Grand Rapids, Mich., and Zooey C. Chu, Holland, Mich., assignors to Steelcase Inc., Grand Rapids, Mich.
Filed May 15, 1986, Ser. No. 864,961
Term of patent 14 years
U.S. Cl. D6—366

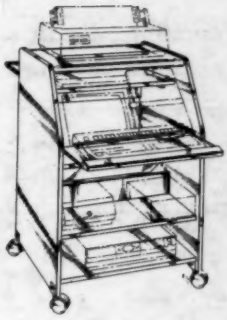
311,287
SEAT
John Behringer, North Kingstown, R.I., assignor to J.G. Furniture Systems, Inc., Quakerstown, Pa.
Filed Jan. 16, 1987, Ser. No. 3,914
The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—366

311,288
ROTATABLE GARMENT STAND
Kil J. Lee, 508 Crocker Ave., Pacific Grove, Calif. 93950
Filed May 11, 1987, Ser. No. 48,071
Term of patent 14 years
U.S. Cl. D6—415

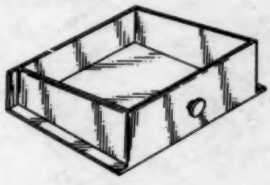
311,289
DISPLAY RACK
Jewell E. Wilson, 1409 S. 15th Ave., Yakima, Wash. 98908; John P. Hodkinson, Jr., 3710 2nd St., and A. L. Molineux, 3802 S. 3rd St., both of Union Gap, Wash. 98903
Filed Sep. 8, 1986, Ser. No. 905,023
Term of patent 14 years
U.S. Cl. D6—461

311,290
REFRIGERATED DISPLAY CASE
Pierre Cocagne, Bidart, France, assignor to Bonnet Refrigeration, Hauts de Seine, France
Division of Ser. No. 850,377, Apr. 7, 1986. This application Jul. 14, 1989, Ser. No. 379,903
Claims priority, application France, Oct. 16, 1985, 85 4823
Term of patent 14 years
U.S. Cl. D6—470

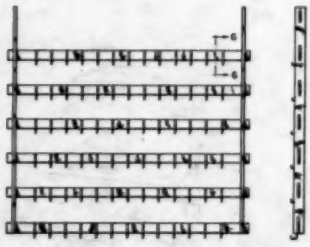
311,291
COMPUTER WORKSTATION
Carlos V. Ugalde, San Dimas, Calif., assignor to Continental Engineering Group, Inc., Irwindale, Calif.
Filed Aug. 18, 1988, Ser. No. 233,571
Term of patent 14 years
U.S. Cl. D6—474



311,292
VEHICLE UTILITY DRAWER OR SIMILAR ARTICLE
Matthew C. Ennis, Jr., 1267 Bear Creek Rd., Martinez, Calif. 94553
Filed Aug. 24, 1987, Ser. No. 88,205
Term of patent 14 years
U.S. Cl. D6—510

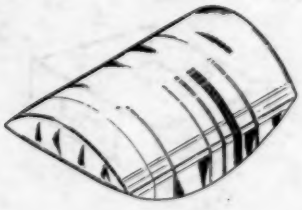


311,293
ADJUSTABLE RACK FOR SUPPORTING ARTICLES BEING SPRAY-PAINTED
Paul M. Edwards, Indianapolis, Ind., assignor to Industrial Coating Services, Inc., Indianapolis, Ind.
Filed Mar. 3, 1988, Ser. No. 163,870
Term of patent 14 years
U.S. Cl. D6—571



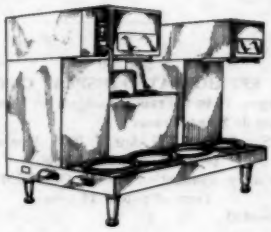
311,294
WINDOW SHADE PULL OR SIMILAR ARTICLE
Robert H. Litowitz, Old Pump House, Harriman Rd., Irvington, N.Y. 10533
Filed Jul. 2, 1987, Ser. No. 69,573
Term of patent 14 years
U.S. Cl. D6—581

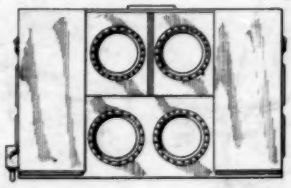
311,295
LUMBAR PAD
Frank L. Roberts, Willowdale, Canada, assignor to Bio-Support Industries Ltd., Toronto, Canada
Filed Feb. 8, 1988, Ser. No. 153,851
Term of patent 14 years
U.S. Cl. D6—601



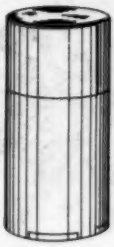
311,296
CARBONATOR
Carl V. Santoiemmo, Gates Mills, Ohio, assignor to United Soda, Inc., Mentor, Ohio
Filed Dec. 29, 1987, Ser. No. 139,043
Term of patent 14 years
U.S. Cl. D7—300

311,297
COMBINED COFFEE MAKING AND HOT WATER DISPENSING MACHINE
Raymond E. Van Camp, Rochester, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.
Filed Mar. 26, 1987, Ser. No. 30,108
Term of patent 14 years
U.S. Cl. D7—308

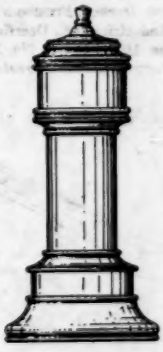




311,298
HOT BEVERAGE MAKER
David V. Mollenhoff, 1501 Morrison St., Madison, Wis. 53703
Filed Nov. 10, 1986, Ser. No. 929,155
Term of patent 14 years
U.S. Cl. D7—300

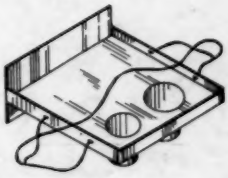


311,299
STANCHION FOR A BEVERAGE TAP
Michael J. Start, Poole, England, assignor to Homark Associates Limited, Poole, Great Britain
Filed Mar. 27, 1987, Ser. No. 31,382
Claims priority, application United Kingdom, Oct. 7, 1986, 1 037 214
Term of patent 14 years
U.S. Cl. D7—397

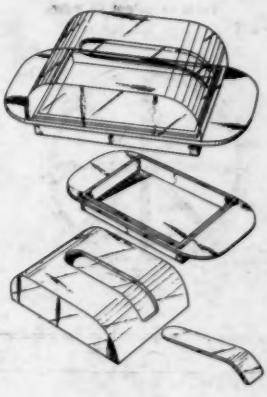


311,300
GOLF BAG COOLER PACK
Donald E. Anderson, 2516 Mericopa St., Torrance, Calif. 90503
Filed Jan. 11, 1988, Ser. No. 142,211
Term of patent 14 years
U.S. Cl. D7—605

311,301
FOOD AND BEVERAGE CARRYING TRAY
Gary B. Starnes, 2506 Kingston St., Dallas, Tex. 75211
Filed Jun. 10, 1988, Ser. No. 204,777
Term of patent 14 years
U.S. Cl. D7—616

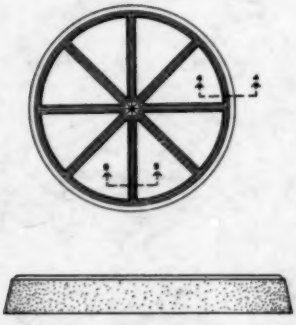


311,302
CONTAINER FOR FOOD
Ambrogio Pozzi, Gallarate, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Aug. 3, 1987, Ser. No. 81,282
Claims priority, application Italy, Feb. 4, 1987, 207354/87[U]
Term of patent 14 years
U.S. Cl. D7—629

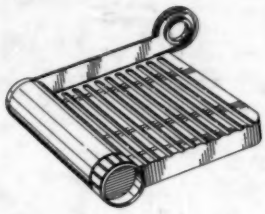


311,303
CUTTING CENTER
Jane Ancona, and Bruce Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Dec. 9, 1988, Ser. No. 281,693
Term of patent 14 years
U.S. Cl. D7—641

311,304
DOUGH CUTTER OR THE LIKE
Dalminder S. Virk, 2826 Neyland Road, Nanaimo, B.C., Canada V9T4J5
Filed Dec. 22, 1988, Ser. No. 288,115
Term of patent 14 years
U.S. Cl. D7—672

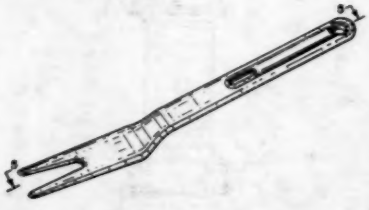


311,305
FOOD SLICER
Galina Melamenchuk, 3 Goldfinch Crescent, Suite 1001, Willowdale, Ontario, Canada (M2R 2C1); Paul T. Arato, Willowdale, and F. William Coffman, Toronto, both of Canada, assignors to Galina Melamenchuk, Toronto, Canada
Filed Oct. 28, 1988, Ser. No. 265,721
Term of patent 14 years
U.S. Cl. D7—673

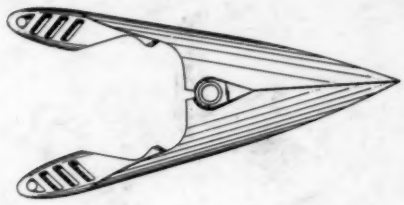


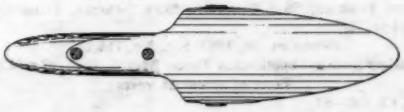
311,306
NUTCRACKER
Bernard G. Gagnon, 122 Wall St., Coventry, Conn. 06238
Filed Oct. 31, 1988, Ser. No. 264,989
Term of patent 14 years
U.S. Cl. D7—680

311,307
KITCHEN UTENSIL OR THE LIKE
Victor J. J. Cautereels, Borsbeek; Pieter K. J. DeCoster, Aalst, and Robert H. C. M. Daenen, Erembodegem, all of Belgium, assignors to Dart Industries Inc., Deerfield, Ill.
Filed Jun. 10, 1988, Ser. No. 206,166
Term of patent 14 years
U.S. Cl. D7—683



311,308
PLANTING TOOL
Gianfranco Romani, Pasiano, Italy, assignor to Claber S.p.A., Italy
Filed Dec. 21, 1988, Ser. No. 288,107
Claims priority, application Italy, Jun. 29, 1988, 21507/88[U]
Term of patent 14 years
U.S. Cl. D8—4





311,309
RAKE
Frank C. McCoy, 4948 F M 2011, Longview, Tex. 75603
Filed Apr. 7, 1989, Ser. No. 334,390
Term of patent 14 years
U.S. Cl. D8—13

311,310
ADJUSTABLE RAKE HEAD
Franco Clivio, Zürich, Switzerland, assignor to Gardena Kress & Kastner GmbH, Fed. Rep. of Germany
Filed Feb. 27, 1989, Ser. No. 315,700
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1988, M 8801176.3
Term of patent 14 years
U.S. Cl. D8—13

311,311
HOOK FOR USE IN CONCRETE CONSTRUCTION
Lynn Metzger, 4680 Dungan Rd., Circleville, Ohio 43113
Filed May 31, 1985, Ser. No. 740,002
Term of patent 14 years
U.S. Cl. D8—14

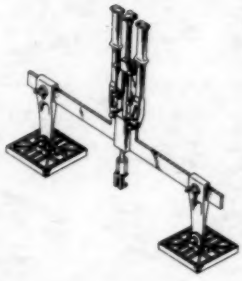
311,312
COMBINED FIFTH WHEEL PIN PULLER AND TIRE KNOCKER
James F. Morton, 3800 Cheryl St., Bucyrus, Ohio 44820
Filed Oct. 6, 1987, Ser. No. 105,536
Term of patent 14 years
U.S. Cl. D8—14

311,313
WRENCH
John F. Whiteside, Franklin Park, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.
Filed Sep. 12, 1988, Ser. No. 245,052
Term of patent 14 years
U.S. Cl. D8—17

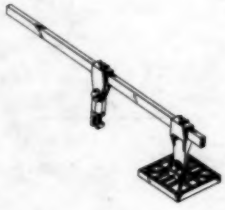
311,314
PUSH-BUTTON RATCHET WRENCH
Bao L. Chang, No. 20, Alley, 39, East 1st Lane, Sec. 2, Chang Ping Road, Pei Twen District, Taichung, Taiwan
Filed Sep. 12, 1988, Ser. No. 243,022
Term of patent 14 years
U.S. Cl. D8—25

311,315
TUB STRAINER WRENCH WITH MULTI-POSITIONABLE HANDLE
Robert L. Duke, 4154 Arden St., Clemmons, N.C. 27012
Filed Nov. 13, 1987, Ser. No. 120,511
Term of patent 14 years
U.S. Cl. D8—25

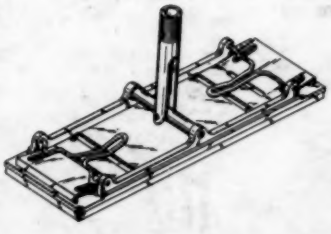
311,316
DENT PULLER
Kousei Ishihara, 55-7 Takashimadaira 1-chome, Itabashi-ku, Tokyo, Japan
Filed Oct. 26, 1987, Ser. No. 114,131
Claims priority, application Japan, May 6, 1987, 62-17423
Term of patent 14 years
U.S. Cl. D8—51



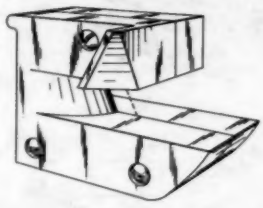
311,317
DENT PULLER
Kousei Ishihara, 55-7 Takashimadaira 1-chome, Itabashi-ku, Tokyo, Japan
Filed Oct. 26, 1987, Ser. No. 114,133
Claims priority, application Japan, May 6, 1987, 62-17425
Term of patent 14 years
U.S. Cl. D8—51



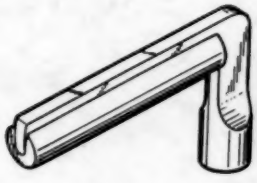
311,318
HEAD FOR A POLE-TYPE SANDER
Melvin L. Ovens, 15855-84th Avenue, Surrey, British Columbia V3S 2N8, Canada
Filed Jun. 24, 1987, Ser. No. 65,722
Term of patent 14 years
U.S. Cl. D8—90



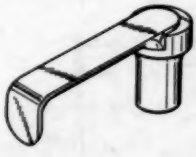
311,319
HOLDER FOR A SKINNING KNIFE
Paul McClelland, Rte. #1, Box 61, Coolville, Ohio 45723
Filed Aug. 18, 1987, Ser. No. 86,656
Term of patent 14 years
U.S. Cl. D8—98



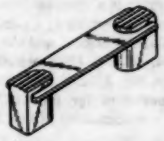
311,320
DOOR HANDLE
Franz W. Jans, Rodermark, Fed. Rep. of Germany, assignor to Jado Bathroom and Hardware Manufacturing Corp., Camarillo, Calif.
Filed May 2, 1988, Ser. No. 189,605
Term of patent 14 years
U.S. Cl. D8—308



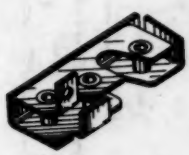
311,321
DOOR HANDLE
Franz W. Jans, Rodermark, Fed. Rep. of Germany, assignor to Jado Bathroom and Hardware Manufacturing Corp., Camarillo, Calif.
Filed Aug. 15, 1988, Ser. No. 231,991
Term of patent 14 years
U.S. Cl. D8—308



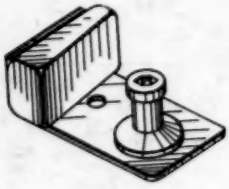
311,322
FURNITURE HANDLE
Franz W. Jans, Rodermark, Fed. Rep. of Germany, assignor to Jado Bathroom and Hardware Manufacturing Corp., Camarillo, Calif.
Filed Aug. 15, 1988, Ser. No. 231,982
Term of patent 14 years
U.S. Cl. D8—316



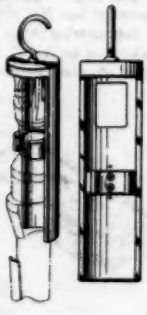
311,323
LATCH HOUSING
Lee S. Weinerman, Medina, and Joel T. Vargus, Middleburg Heights, both of Ohio, assignors to The Eastern Company, Cleveland, Ohio
Continuation of Ser. No. 109,421, Oct. 16, 1987, Pat. No. 304,291, and a continuation-in-part of Ser. No. 109,479, Oct. 6, 1987, Pat. No. 4,896,906, which is a continuation-in-part of Ser. No. 54,687, May 27, 1987, abandoned, which is a continuation of Ser. No. 830,709, Feb. 18, 1986, abandoned, and a continuation-in-part of Ser. No. 303,972, Jan. 30, 1989, Pat. No. 4,917,412, which is a continuation of Ser. No. 191,817, May 3, 1988, abandoned, which is a continuation of Ser. No. 54,687, May 27, 1987, abandoned, which is a continuation of Ser. No. 830,709, Feb. 18, 1986, abandoned, and a continuation-in-part of Ser. No. 320,894, Mar. 9, 1989, abandoned, which is a continuation of Ser. No. 222,349, Jul. 20, 1988, abandoned, which is a continuation of Ser. No. 106,934, Oct. 5, 1987, abandoned, which is a continuation of Ser. No. 830,709, Feb. 18, 1986, abandoned. This application Aug. 7, 1989, Ser. No. 390,669
Term of patent 14 years
U.S. Cl. D8—331



311,324
STRIKE PLATE
Lee S. Weinerman, Medina, and Joel T. Vargus, Middleburg Heights, both of Ohio, assignors to The Eastern Company, Cleveland, Ohio
Continuation of Ser. No. 109,421, Oct. 16, 1987, Pat. No. 304,291, and a continuation-in-part of Ser. No. 109,479, Oct. 16, 1987, Pat. No. 4,896,906, which is a continuation-in-part of Ser. No. 54,687, May 27, 1987, abandoned, which is a continuation of Ser. No. 830,709, Feb. 18, 1986, abandoned, and a continuation-in-part of Ser. No. 303,972, Jan. 30, 1989, Pat. No. 4,917,412, which is a continuation of Ser. No. 191,817, May 3, 1988, abandoned, which is a continuation of Ser. No. 54,687, May 27, 1987, abandoned, which is a continuation of Ser. No. 830,709, Feb. 18, 1986, abandoned, and a continuation-in-part of Ser. No. 320,894, Mar. 9, 1989, abandoned, which is a continuation of Ser. No. 222,349, Jul. 20, 1988, abandoned, which is a continuation of Ser. No. 106,934, Oct. 5, 1987, abandoned, which is a continuation of Ser. No. 830,709, Feb. 18, 1986, abandoned. This application Aug. 7, 1989, Ser. No. 390,671
Term of patent 14 years
U.S. Cl. D8—344



311,325
AIR RATCHET HANGING DEVICE
Michael C. Sullivan, 18975 Reindeer DR., Lake Elsinore, Calif. 92330
Filed Feb. 29, 1988, Ser. No. 161,658
Term of patent 14 years
U.S. Cl. D8—396

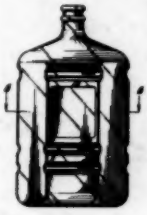


311,326
TRUCK FLOOR BED TIE-DOWN DEVICE
Marvin I. Nelson, 613 N. Washington, Dell Rapids, S. Dak. 57022
Filed Jun. 26, 1986, Ser. No. 879,184
Term of patent 14 years
U.S. Cl. D8—356

311,327
HOLDER FOR A BUCKET OR SIMILAR ARTICLE
Mack Hughes, 29310 Juban Rd., Denham Springs, La. 70726
Filed Mar. 17, 1989, Ser. No. 324,622
Term of patent 14 years
U.S. Cl. D8—370

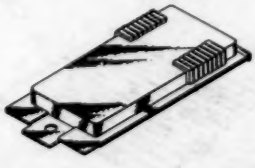
311,328
COMBINED CONTAINER AND CLOSURE
Gijsbertus van der Tang, Zegveld, Netherlands, assignor to Colorstik Ltd., Beverly Hills, Calif.
Filed Mar. 19, 1967, Ser. No. 27,781
Term of patent 14 years
U.S. Cl. D9—337

311,329
BOTTLE
Carl E. Frahm, 1428 Oak Meadow Rd., Arcadia, Calif. 91006, and B. Joseph Rokus, 1420 Oak Meadow Rd., Arcadia, Calif. 91006, assignors to Joseph Rokus, Arcadia, Calif. and Tari Rokus, Arcadia, Calif.
Filed Apr. 11, 1988, Ser. No. 180,029
Term of patent 14 years
U.S. Cl. D9—400

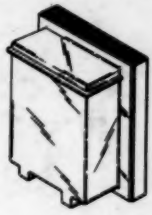


311,330
CONFECTION PACKAGE
Akimitsu Hamamura, Utsunomiya, Japan, assignor to Fantasy Flavors Inc., Wheaton, Ill.
Filed Nov. 7, 1986, Ser. No. 929,230
Term of patent 14 years
U.S. Cl. D9—428

311,331
CONTAINER FOR LOTTERY TICKETS
Keyvan T. Diba, 11841 Goshen Ave., Apt. 4, Los Angeles, Calif. 90049, and Allan M. Shapiro, 15315 Magnolia Blvd., #105, Sherman Oaks, Calif. 91403
Filed Nov. 18, 1988, Ser. No. 273,312
Term of patent 14 years
U.S. Cl. D9—415



311,332
BOOK BLISTER PACKAGE
Ruth E. Miller, and Jack V. Miller, both of 700 N. Auburn Ave., Sierra Madre, Calif. 91024
Filed Apr. 27, 1987, Ser. No. 81,035
The portion of the term of this patent subsequent to Oct. 10, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—415

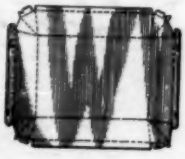


311,333
CONTAINER
Clinton Fultz, 5317 O'Neall Rd., Waynesville, Ohio 45068, and Stanley Dalton, Germantown, Ohio, assignors to Clinton Fultz, Waynesville, Ohio
Filed Jul. 12, 1988, Ser. No. 218,599
Term of patent 14 years
U.S. Cl. D9—423

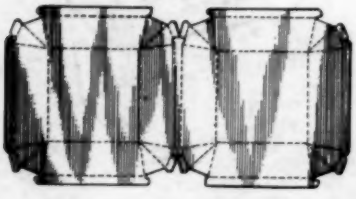
311,334
CONTAINER
David P. Flynn, Kew, and Peter K. Bayly, Balwyn, both of Australia, assignors to Willow Ware Australia Pty. Limited, Melbourne, Australia
Filed Jul. 6, 1988, Ser. No. 216,700
Claims priority, application Australia, Apr. 14, 1988, 1174/88
Term of patent 14 years
U.S. Cl. D9—424

311,335
PACKAGE FOR A DISPOSABLE CAMERA
Takuya Arai, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Nov. 24, 1986, Ser. No. 934,453
Claims priority, application Japan, May 23, 1986, 61-19620
Term of patent 14 years
U.S. Cl. D9—432

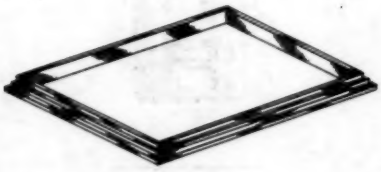
311,336
TRAY BLANK
Rune K. Haraldsson, Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.
Filed Sep. 10, 1987, Ser. No. 94,796
Term of patent 14 years
U.S. Cl. D9—433



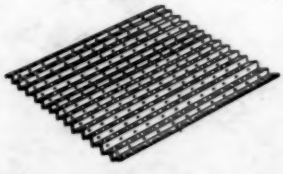
311,337
TWIN TRAY BLANK
William R. Rigby, Elkton, Md., assignor to Westvaco Corporation, New York, N.Y.
Filed Sep. 10, 1987, Ser. No. 94,797
Term of patent 14 years
U.S. Cl. D9—433



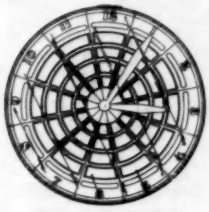
311,338
SEAL FOR CONTAINERS
Donald L. Serio, Jr., Fontana, Calif., assignor to Serco Mold, Inc., Covina, Calif.
Filed Jun. 27, 1988, Ser. No. 211,852
Term of patent 14 years
U.S. Cl. D9—434



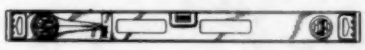
311,339
PIZZA RACK FOR A CARTON
Robert E. Weed, 1445 S. Laramie Ave., Chicago, Ill. 60650
Filed Nov. 20, 1987, Ser. No. 123,661
Term of patent 14 years
U.S. Cl. D9—456



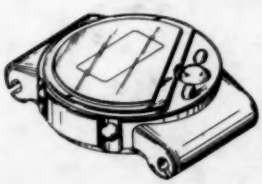
311,340
MEDICINE CLOCK
John F. Armstrong, 5500 Oceanshore Blvd., Unit 18, Ormond Beach, Fla. 32074
Filed Jul. 28, 1987, Ser. No. 78,696
Term of patent 14 years
U.S. Cl. D10—2



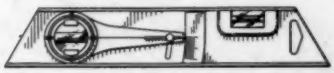
311,341
COMBINED SPIRIT LEVEL AND ANGLE-INDICATED DEVICE
Garry I. Lewis, Gresham Pl., Treharris, Mid Glamorgan, and Terrence Huxley, 66 Bedwellty Rd., Aberbargoed, Mid Glamorgan, both of United Kingdom
Filed Dec. 14, 1987, Ser. No. 132,138
Claims priority, application United Kingdom, Jun. 16, 1987, 1042873
Term of patent 14 years
U.S. Cl. D10—62



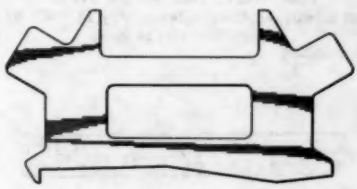
311,342
COMBINED WRISTWATCH AND COUNT-DOWN TIMER
John T. Houlihan, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.
Filed May 11, 1987, Ser. No. 48,282
Term of patent 14 years
U.S. Cl. D10—30



311,343
COMBINED SPIRIT LEVEL AND ANGLE-INDICATING DEVICE
Terrence Huxley, 66 Bedwellty Rd., Aberbargoed, Mid Glamorgan, and Garry I. Lewis, Gresham Pl., Treharris, Mid Glamorgan, both of United Kingdom
Filed Dec. 15, 1987, Ser. No. 133,051
Claims priority, application United Kingdom, Jun. 16, 1986, 1042874
Term of patent 14 years
U.S. Cl. D10—62

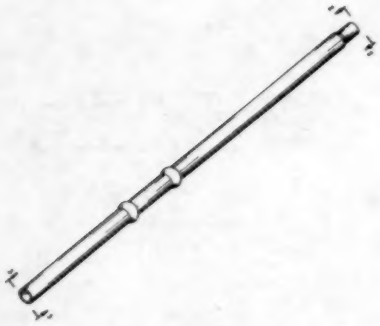


311,344
SHELLFISH GAUGE
George M. Vanish, 8002 Aquadale Dr., Youngstown, Ohio 44512
Filed Mar. 15, 1988, Ser. No. 168,333
Term of patent 14 years
U.S. Cl. D10—64



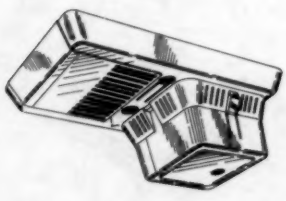
311,345
DIGITAL CIRCUIT BOARD TESTER
Jeffrey C. Brown, Seattle, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.
Filed Nov. 13, 1987, Ser. No. 122,653
Term of patent 14 years
U.S. Cl. D10—78

311,346
ELECTRONIC TEST PROBE
Robert F. Gross, Andover, Mass., assignor to Q.A. Technology Company, Exeter, N.H.
Filed Sep. 25, 1987, Ser. No. 101,169
Term of patent 14 years
U.S. Cl. D10—80

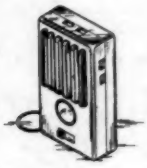


311,347
TACHOMETER
Yasuhisa Nakajima, Tokyo, Japan, assignor to Car Mate Manufacturing Co., Ltd., Tokyo, Japan
Filed Nov. 12, 1987, Ser. No. 119,427
Claims priority, application Japan, May 14, 1987, 62-18934
Term of patent 14 years
U.S. Cl. D10—98

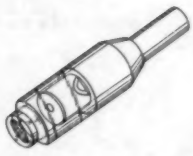
311,348
TALKING SMOKE DETECTOR
Louis L. Mastro, Milford, and Kenneth R. Parker, Madison Heights, both of Mich., assignors to Pioneer Data Corporation, Fla.
Filed Aug. 12, 1988, Ser. No. 231,791
Term of patent 14 years
U.S. Cl. D10—106



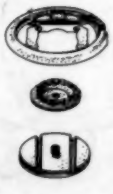
311,349
COMBINED PERSONAL ALARM AND KEY RING
James M. Walsh, Mission Viejo, Calif., assignor to W. W. B. A. Incorporated, Mission Viejo, Calif.
Filed Jul. 21, 1988, Ser. No. 222,708
Term of patent 14 years
U.S. Cl. D10—106



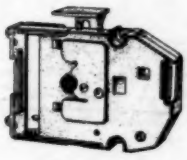
311,350
WHISTLE
Shintaro Tsuji, Tokyo, Japan, assignor to Sanrio Company, Ltd., Japan
Filed Aug. 5, 1988, Ser. No. 229,026
Term of patent 14 years
U.S. Cl. D10—119



311,351
WATCH SUPPORT
Hans Zaugg, Derendingen, and Olivier Koch, Eschert, both of Switzerland, assignors to Swatch SA, Bienne, Switzerland
Filed Nov. 18, 1987, Ser. No. 122,064
Term of patent 14 years
U.S. Cl. D10—128



311,352
CLOCK MOVEMENT
Makoto Tanaka, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Feb. 6, 1987, Ser. No. 12,035
Claims priority, application Japan, Oct. 23, 1986, 42077
Term of patent 14 years
U.S. Cl. D10—129



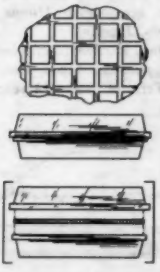
311,353
CLOCK MOVEMENT
Tetsuro Suzuki, and Katsuhiro Hatano, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan
Filed Jan. 29, 1987, Ser. No. 8,426
Claims priority, application Japan, Sep. 18, 1986, 61-36866
Term of patent 14 years
U.S. Cl. D10—129

311,354
NECKLACE
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Dec. 14, 1987, Ser. No. 132,132
Claims priority, application Italy, Jun. 22, 1987, 35872-B/87
Term of patent 14 years
U.S. Cl. D11—13

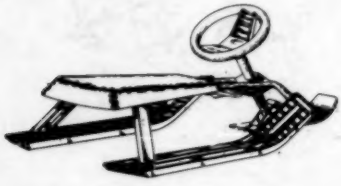
311,355
EXPANSION BRACELET
Murray L. Cowan, Norwood, Mass., assignor to Textron, Inc., Providence, R.I.
Filed Jun. 20, 1988, Ser. No. 209,027
Term of patent 14 years
U.S. Cl. D11—19

311,356
MEDALLION
Patrick H. De Frahan, Brussels, Belgium, assignor to Innovative Trading & Service S.A., Brusseles, Belgium
Filed Jun. 29, 1988, Ser. No. 213,984
Claims priority, application France, May 24, 1988, DM/011006
Term of patent 14 years
U.S. Cl. D11—79

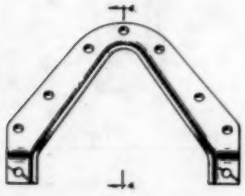
311,357
COMBINED TERRARIUM AND POTTING TRAY
Francis Addy, 13240 Belcher Rd. South, Largo, Fla. 33543
Filed Jan. 27, 1986, Ser. No. 822,318
Term of patent 14 years
U.S. Cl. D11—145



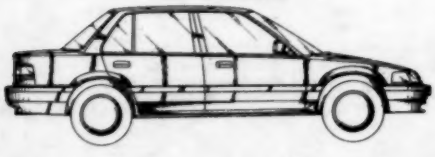
311,358
SLED
Michel Dallaire, Montreal, Canada, assignor to St.-Lawrence Manufacturing Canada Inc./Manufactures St.-Laurent Canada, Inc., Beauport, Canada
Filed May 9, 1988, Ser. No. 190,934
Claims priority, application Canada, Jan. 19, 1988, 19-01-88-1
Term of patent 14 years
U.S. Cl. D12—10



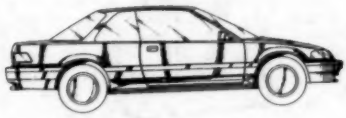
311,359
RAILROAD HOPPER CAR CROSS RIDGE COLLAR CASTING
Keith J. Hallam, Norcross, and Kenneth H. Smith, Powder Springs, both of Ga., assignors to Thrall Car Manufacturing Company, Chicago Heights, Ill.
Filed Feb. 18, 1988, Ser. No. 157,315
Term of patent 14 years
U.S. Cl. D12—42



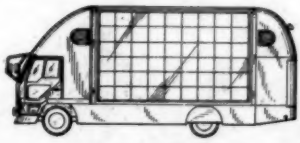
311,360
AUTOMOBILE
Humirou Yoshikawa; Tsuyoshi Nishimura, and Syuhei Ueda, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 15, 1987, Ser. No. 62,824
Claims priority, application Japan, Dec. 15, 1986, 61-49567
Term of patent 14 years
U.S. Cl. D12—92



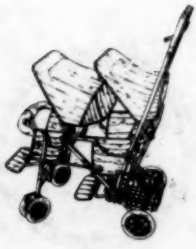
311,361
AUTOMOBILE
Yoshinso Fujimura, Kodaira; Tavo Ueda, and Yusuke Saitoh, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 29, 1987, Ser. No. 79,272
Claims priority, application Japan, Jan. 30, 1987, 62-3357
Term of patent 14 years
U.S. Cl. D12—92



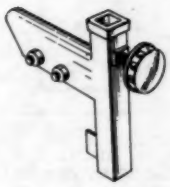
311,362
TRUCK EQUIPPED WITH LARGE SCREEN TELEVISION RECEIVER
Shoji Kuwata, Yokohama, Japan, assignor to Kabushiki Kaisha Top Gun, Tokyo, Japan
Filed Feb. 16, 1988, Ser. No. 157,333
Claims priority, application Japan, Aug. 14, 1987, 62-33245
Term of patent 14 years
U.S. Cl. D12—96



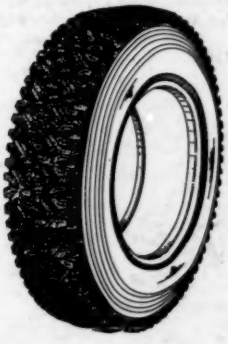
311,363
BABY CARRIAGE
Chih-Chung Lin, 265, Fu Hsing Rd., Shuh Lin Chen, Taipei Hsien, Taiwan
Filed Apr. 18, 1988, Ser. No. 183,034
Term of patent 14 years
U.S. Cl. D12—129



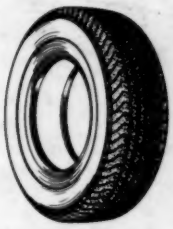
311,364
ARM REST ENGAGABLE MOUNTING BRACKET
Charles F. Wood, 8341 W. Foothill Dr., Peoria, Ariz. 85345
Filed Feb. 9, 1987, Ser. No. 12,636
Term of patent 14 years
U.S. Cl. D12—133



311,365
VEHICLE TIRE
Kevin J. Niderost, Solihull, England, assignor to SP Tyres UK Limited, Birmingham, England
Filed Jun. 25, 1987, Ser. No. 66,416
Claims priority, application United Kingdom, Jan. 31, 1987, 1039661
The portion of the term of this patent subsequent to Dec. 19, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—146

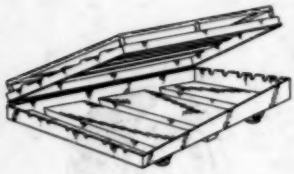


311,366
AUTOMOBILE TIRE
Yutaka Kuroda, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Feb. 18, 1988, Ser. No. 157,313
Claims priority, application Japan, Aug. 29, 1987, 62-35365
Term of patent 14 years
U.S. Cl. D12—147

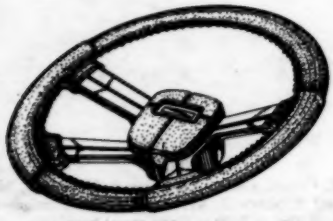


311,367
TIRE
Darrell E. Covert, Uniontown; Philip S. Hammond, Mogadore, and Paul B. Maxwell, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jun. 21, 1988, Ser. No. 209,407
Term of patent 14 years
U.S. Cl. D12—147

311,368
COMBINED VEHICLE FISHING ROD HOLDER AND LUGGAGE CARRIER
Jesse C. Garcia, 239 Devonshire, San Antonio, Tex. 78209
Filed Feb. 5, 1988, Ser. No. 153,014
Term of patent 14 years
U.S. Cl. D12—157



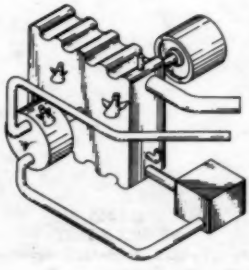
311,369
STEERING WHEEL
Warwick M. Whitley, II, Panama City, Fla., assignor to Attwood Corporation, Lowell, Mich.
Filed Aug. 12, 1988, Ser. No. 231,386
Term of patent 14 years
U.S. Cl. D12—176



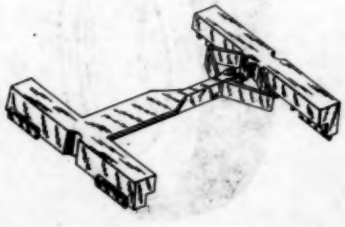
311,370
JET AIRCRAFT WITH CIRCULAR HOLLOW WINGS
Brian H. Park, 204-1 Rockledge Pl., Huntsville, Ala. 35806
Filed Apr. 6, 1987, Ser. No. 34,575
Term of patent 14 years
U.S. Cl. D12—331

311,371
COMBINED WALL SWITCH PLATE AND SWITCH THEREFOR
Elliot G. Jacoby, Glenside, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.
Filed Dec. 31, 1984, Ser. No. 687,995
Term of patent 14 years
U.S. Cl. D13—171

311,372
WATER DRIVE POWER UNIT
Herman J. Angel, 162 Cherokee Ave., Camden, Tenn. 38320
Filed Jul. 21, 1988, Ser. No. 222,246
Term of patent 14 years
U.S. Cl. D13—114



311,373
ADJUSTABLE BATTERY WIDTH AND HEIGHT ADAPTOR
Jeffrey A. Morisse, West Bend; Gregg A. Herde, Milwaukee; David W. Saari, South Milwaukee; Edward N. Mrotek, Cedarburg, and Thomas J. Dougherty, Waukesha, all of Wis., assignors to Johnson Service Company, Milwaukee, Wis.
Filed Aug. 21, 1987, Ser. No. 87,756
Term of patent 14 years
U.S. Cl. D13—119



311,374

HOUSING FOR AN ELECTRICAL CONNECTOR

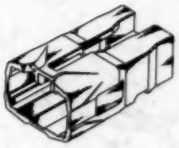
Toshiharu Kawashima; Keishi Jinno, and Yoshitsugu Sawada, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

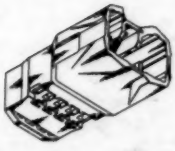
Filed May 13, 1988, Ser. No. 194,001

Claims priority, application Japan, Nov. 13, 1987, 62-46251; Nov. 13, 1987, 62-46252; Nov. 13, 1987, 62-46253

Term of patent 14 years

U.S. Cl. D13—133





311,375

HOUSING FOR AN ELECTRICAL CONNECTOR

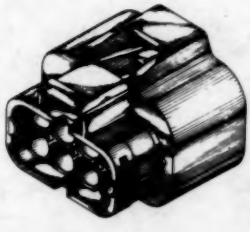
Katsutoshi Kuzuno; Shigeo Ishizuka, and Hiroshi Watanabe, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Mar. 15, 1988, Ser. No. 168,340

Claims priority, application Japan, Sep. 16, 1987, 62-37491; Sep. 18, 1987, 62-37850; Sep. 18, 1987, 62-37851

Term of patent 14 years

U.S. Cl. D13—133



311,376

HOUSING FOR AN ELECTRICAL CONNECTOR

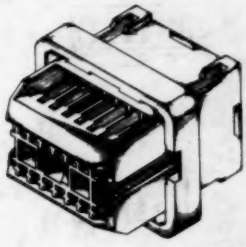
Takayuki Yamamoto, Kosai, and Sakae Tsukamoto, Shimada, both of Japan, assignors to Yazaki Corporation, Japan

Filed Jan. 4, 1988, Ser. No. 140,743

Claims priority, application Japan, Jul. 3, 1987, 62-26912

Term of patent 14 years

U.S. Cl. D13—133



311,377

ELECTRICAL CONNECTOR ASSEMBLY

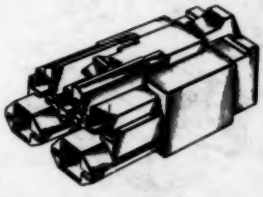
Tatsuya Oka, Age; Hideki Ogawa, and Sho-Ichi Sugata, both of Suzuka, all of Japan, assignors to Sumitomo Wiring Systems, Ltd., Suzuka, Japan

Filed Jan. 11, 1988, Ser. No. 142,884

Claims priority, application Japan, Jul. 10, 1987, 62-28170; Jul. 10, 1987, 62-28171

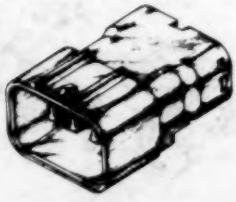
Term of patent 14 years

U.S. Cl. D13—133

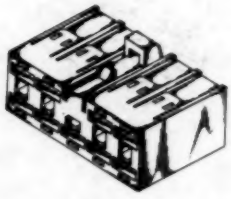


311,378
TERMINAL BLOCK ASSEMBLY FOR A LEADLESS MOTOR
Arthur C. Keck, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.
Filed Feb. 12, 1988, Ser. No. 155,625
Term of patent 14 years
U.S. Cl. D13—146

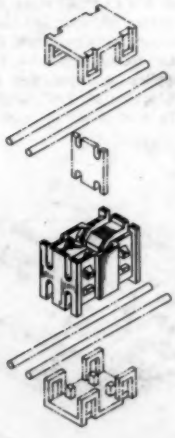
311,379
HOUSING FOR AN ELECTRICAL CONNECTOR
Katsutoshi Kuzuno; Shigeo Ishizuka; Hiroshi Watanabe, and Kazuaki Sakurai, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan
Filed Mar. 15, 1988, Ser. No. 168,731
Claims priority, application Japan, Sep. 16, 1987, 62-37492; Sep. 18, 1987, 62-37852; Sep. 18, 1987, 62-37853; Sep. 18, 1987, 62-37855
Term of patent 14 years
U.S. Cl. D13—146



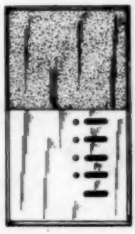
311,380
HOUSING FOR AN ELECTRICAL CONNECTOR
Isao Kameyama, and Akira Maeda, both of Kosai, Japan, assignors to Yazaki Corporation, Japan
Filed Oct. 30, 1987, Ser. No. 114,825
Claims priority, application Japan, Apr. 30, 1987, 62-16639
Term of patent 14 years
U.S. Cl. D13—146



311,381
CONNECTOR HOUSING FOR ELECTRICAL WIRE
Takayoshi Endo, and Masayuki Yamamoto, both of Gotenba, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Jul. 30, 1987, Ser. No. 79,604
Claims priority, application Japan, Jan. 30, 1987, 62-003091
Term of patent 14 years
U.S. Cl. D13—149

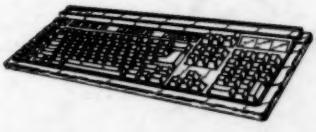


311,382
FACE PLATE FOR LIGHTING CONTROL
Noel Mayo, Philadelphia; Zalman A. Liss, Allentown, and Joel S. Spira, Coopersburg, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.
Filed Apr. 14, 1988, Ser. No. 182,075
Term of patent 14 years
U.S. Cl. D13—164

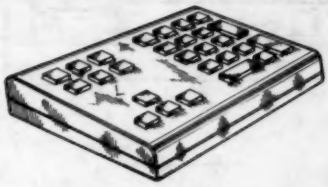


311,383
PROTECTIVE COVER FOR MARINE INSTRUMENTS ON A CONTROL CONSOLE
Frans G. Falck, Torslanda, Sweden, assignor to Aktiebolaget Volvo, Gothenburg, Sweden
Filed Oct. 13, 1987, Ser. No. 107,586
Claims priority, application Sweden, Apr. 14, 1987, 87-0852
Term of patent 14 years
U.S. Cl. D13—177

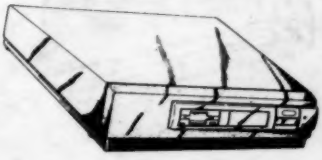
311,384
KEYBOARD
Arthur B. Lazere, Wayzata; William E. Ingold, Coon Rapids, and Bradley N. Knilans, Robbinsdale, all of Minn., assignors to Northgate Computer Systems, Inc., Plymouth, Minn.
Filed Apr. 14, 1989, Ser. No. 338,134
The portion of the term of this patent subsequent to Oct. 23, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—100



311,385
COMPUTER KEYPAD
Howard I. Arkin, 525 E. 81st St., New York, N.Y. 10028
Filed Sep. 15, 1988, Ser. No. 245,328
Term of patent 14 years
U.S. Cl. D14—100

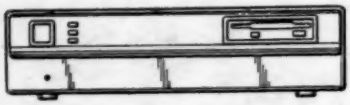


311,386
COMPUTER
Peter S. MacDonald, Reading, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.
Filed Nov. 28, 1988, Ser. No. 277,065
Term of patent 14 years
U.S. Cl. D14—100

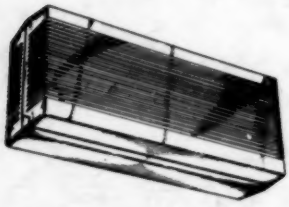


311,387
DATA PROCESSOR
Allen J. Brenneman, Elkhart, Ind., and Jeanne McLean, Lisle, Ill., assignors to Miles Inc., Elkhart, Ind.
Filed Apr. 7, 1989, Ser. No. 334,385
Term of patent 14 years
U.S. Cl. D14—100

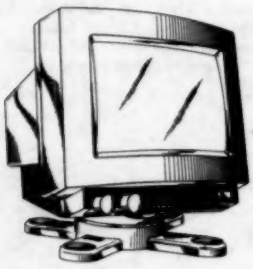
311,388
CENTRAL PROCESSOR UNIT FOR DATA SYSTEMS
Isamu Yoshitake, Fuchu, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Feb. 27, 1989, Ser. No. 316,450
Term of patent 14 years
U.S. Cl. D14—100



311,389
HOUSING FOR A LOCAL AREA NETWORK UNIT
Edward W. Festa, Holmdel, N.J.; Chris G. Johnson, Briarcliff Manor, N.Y., and Chaonong Yoh, Matawan, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Mar. 13, 1989, Ser. No. 322,825
Term of patent 14 years
U.S. Cl. D14—107

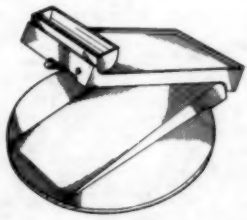


311,390
VIDEO DISPLAY
Lawrence Kuba, Nashua, N.H., assignor to Wang Laboratories, Inc., Lowell, Mass.
Filed May 4, 1988, Ser. No. 190,295
Term of patent 14 years
U.S. Cl. D14—113



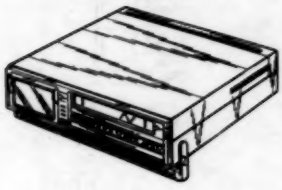
311,391
DATA RECORDING CARTRIDGE FOR LANGUAGE LEARNING MACHINE
Akito Ueshin; Hidekiyo Kushima, both of Yokohama, and Shinichi Ishigame, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 7, 1988, Ser. No. 164,727
Claims priority, application Japan, Sep. 8, 1987, 62-36434
Term of patent 14 years
U.S. Cl. D14—114

311,392
ADJUSTABLE SUPPORT FOR A DISPLAY MONITOR
Christopher J. Hillary, Eastleigh, and Timothy J. Rodd, Lyndhurst, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 3, 1987, Ser. No. 57,140
Claims priority, application United Kingdom, Dec. 8, 1986, 1038608
Term of patent 14 years
U.S. Cl. D14—114



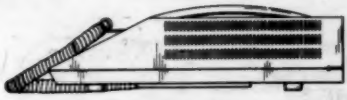
311,393
HOUSING FOR AN ELECTRONIC BAR CODE READER
Frederick M. Weaver, and Donna E. Goodner, both of Charlotte, N.C., assignors to Hand Held Products, Inc., Charlotte, N.C.
Filed Sep. 30, 1988, Ser. No. 252,123
Term of patent 14 years
U.S. Cl. D14—116

311,394
COMBINED VIDEO CASSETTE RECORDER AND TELEVISION RECEIVER
Jae J. Shim, Kyungki, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Feb. 24, 1988, Ser. No. 160,074
Claims priority, application Rep. of Korea, Aug. 25, 1987, 12883/1987
Term of patent 14 years
U.S. Cl. D14—129

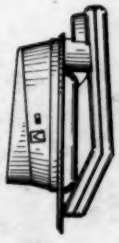


311,395
COMBINED VIDEO TAPE RECORDER AND TELEVISION SET
Toshio Igo, Tokorozawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Dec. 22, 1988, Ser. No. 289,575
Term of patent 14 years
U.S. Cl. D14—129

311,396
DATA CONVERTER FOR DIGITAL COMMUNICATION WITH A TELEPHONE
Takashi Kajita, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 11, 1989, Ser. No. 378,310
Claims priority, application Japan, Jan. 18, 1989, 1116/89
Term of patent 14 years
U.S. Cl. D14—144



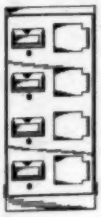
311,397
TELEPHONE SET
Vivian W. K. Cheng, 27/F flat B, Block One, Ravana Garden, Satin, Hong Kong
Filed Apr. 17, 1989, Ser. No. 340,539
Claims priority, application United Kingdom, Oct. 18, 1988, 1,054,344
Term of patent 14 years
U.S. Cl. D14—149

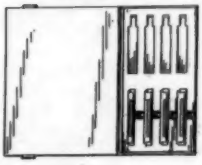


311,398
TELEPHONE
Yoshihiko Sugano, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 7, 1989, Ser. No. 376,410
Claims priority, application Japan, Jan. 13, 1989, 623/89
Term of patent 14 years
U.S. Cl. D14—151

311,399
TELEPHONE SET
Takaharu Ando, Ryugasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Jun. 2, 1989, Ser. No. 360,744
Claims priority, application Japan, Dec. 24, 1988, 63-50028
Term of patent 14 years
U.S. Cl. D14—241

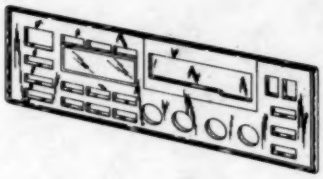
311,400
COMMUNICATION QUAD RACK UNIT
Arvin D. Danielson, Solon; Robert G. Geers, Cedar Rapids, both of Iowa; Calvin Greenfield, Platteville, Wis.; John G. Pavek, and Robert J. Traeger, both of Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa
Filed Apr. 22, 1987, Ser. No. 41,582
Term of patent 14 years
U.S. Cl. D14—250



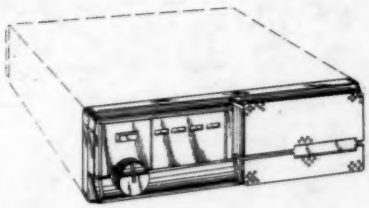


311,401
EXTENSION ATTACHMENT FOR A TELEPHONE EARPIECE
Harry Catey, 3330 91st St. Southeast, and Erling C. Hesla, 620 112th St. Southeast, #157, both of Everett, Wash. 98208
Division of Ser. No. 207,349, Jun. 15, 1988, Pat. No. Des. 305,027. This application Aug. 25, 1989, Ser. No. 398,851
Term of patent 14 years
U.S. Cl. D14—250

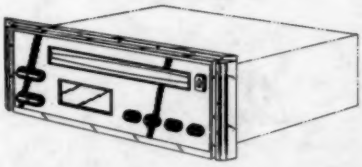
311,402
APERTURED PANEL FOR A COMBINED VEHICULAR TAPE PLAYER AND RADIO OR THE LIKE
Clive A. Grinyer, London, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.
Division of Ser. No. 856,094, Apr. 17, 1986. This application Jun. 15, 1987, Ser. No. 61,998
Term of patent 14 years
U.S. Cl. D14—258



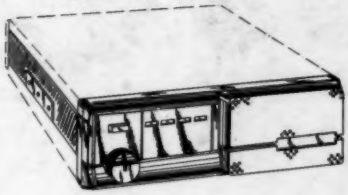
311,403
FRONT PANEL FOR A TWO-WAY MOBILE RADIO
Richard Culbertson, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Division of Ser. No. 922,990, Oct. 20, 1986, Pat. No. 303,802. This application May 8, 1989, Ser. No. 348,651
Term of patent 14 years
U.S. Cl. D14—258



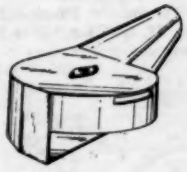
311,404
FRONT PANEL FOR A COMPACT DISC PLAYER
Carol M. Repasky, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed May 30, 1989, Ser. No. 359,057
Term of patent 14 years
U.S. Cl. D14—258

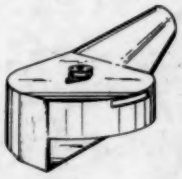


311,405
FRONT AND SIDE PANELS FOR A TWO-WAY MOBILE RADIO
Richard Culbertson, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Division of Ser. No. 922,445, Oct. 20, 1986, Pat. No. 304,195. This application Jun. 7, 1989, Ser. No. 363,461
Term of patent 14 years
U.S. Cl. D14—265

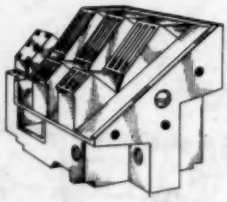


311,406
COMBINED GRASS CATCHER BLOWER AND CHUTE
Thomas L. Hoepfner, 98 Prairiewood Dr., Fargo, N. Dak. 58103
Filed May 4, 1987, Ser. No. 45,137
Term of patent 14 years
U.S. Cl. D15—17

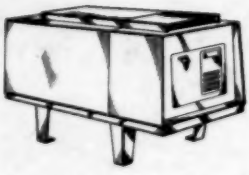




311,407
MACHINE TOOL BED
Claudia D. Brown, Bressport; Brian M. Eaton, Pine City, and Robert B. Carlyle, Horseheads, all of N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.
Filed Nov. 10, 1987, Ser. No. 118,996
Term of patent 14 years
U.S. Cl. D15—141



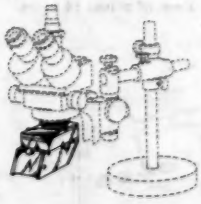
311,408
ADHESIVE SUPPLY UNIT
Paul J. Donley, Monterey, and Michael A. Webster, Carmel Valley, both of Calif., assignors to Graco Inc., Minneapolis, Minn.
Filed Mar. 22, 1988, Ser. No. 171,879
Term of patent 14 years
U.S. Cl. D15—199



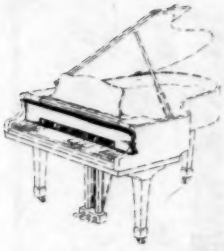
311,409
EYE SHIELD
Joel H. Goffman, 8535 W. Bellfort, Houston, Tex. 77071
Filed Aug. 27, 1987, Ser. No. 90,106
Term of patent 14 years
U.S. Cl. D16—100

311,410
UNDERWATER VIEWER
Charles P. Hall, 5815 Bennett Valley Rd., Santa Rosa, Calif. 95404-9736
Filed Nov. 23, 1987, Ser. No. 124,468
Term of patent 14 years
U.S. Cl. D16—130

311,411
INSTRUMENT FOR DIAGONAL OBSERVATION BY MICROSCOPE
Zensuke Sato, 2607-5 Ooza-kainuma, Kawagoe-shi, Saitama-ken, Japan
Filed Apr. 28, 1988, Ser. No. 187,416
Claims priority, application Japan, Dec. 15, 1987, 62-50955
Term of patent 14 years
U.S. Cl. D16—131



311,412
COMBINED GRAND PIANO KEYBOARD COVER AND AUTO-PLAY CONTROL UNIT
Kunio Ohta, Hamamatsu, Japan, assignor to Nippon Gakki Seizu Kabushiki Kaisha, Japan
Filed May 19, 1987, Ser. No. 51,997
Term of patent 14 years
U.S. Cl. D17—9

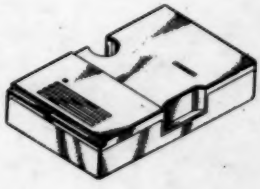


311,413
GUITAR BODY
Andrew Pakis, 21 Baldwin Ave., Morganville, N.J. 07751
Filed Aug. 3, 1987, Ser. No. 80,693
Term of patent 14 years
U.S. Cl. D17—20

311,414
TUNING MACHINE FOR GUITAR
Daniel J. Smith, and Charles H. Todd, III, both of La Habra, Calif., assignors to Fender Musical Instruments Corporation, Brea, Calif.
Filed May 6, 1983, Ser. No. 492,216
Term of patent 14 years
U.S. Cl. D17—20

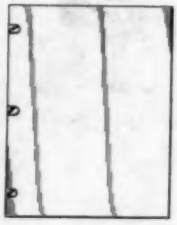
311,415
GUITAR PLAYING APPARATUS
Kunihiko Uchiyama, Tokyo, Japan, assignor to Kabushikigaisha Taito, Tokyo, Japan
Filed Oct. 29, 1987, Ser. No. 114,067
Claims priority, application Japan, Apr. 30, 1987, 62-16661
Term of patent 14 years
U.S. Cl. D17—24

311,416
THERMAL PRINTER TAPE RIBBON CARTRIDGE
Michael M. Richardson, Scottsdale, Ariz., and Geoff Ringle, Trenton, N.J., assignors to Kroy Inc., Scottsdale, Ariz.
Filed Feb. 1, 1988, Ser. No. 151,328
Term of patent 14 years
U.S. Cl. D18—22

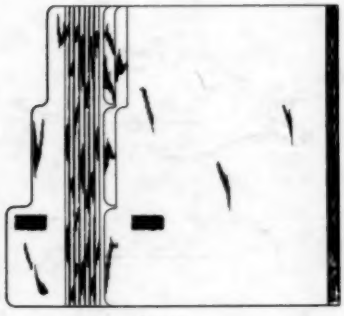


311,417
COPYING MACHINE
Mikio Kosako, and Youichi Tatsuta, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jan. 14, 1988, Ser. No. 144,854
Claims priority, application Japan, Jul. 17, 1987, 62-29330
Term of patent 14 years
U.S. Cl. D18—39

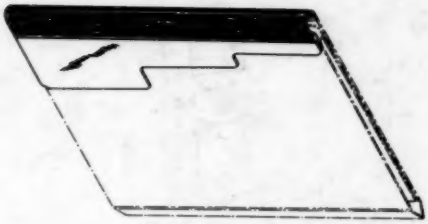
311,418
COMBINED PAPER SHEETS AND APERTURE FASTENERS THEREFOR
Charles T. Groswith, III, Los Altos, and Rickson Sun, Palo Alto, both of Calif., assignors to Taurus Holdings, Inc., Mountain View, Calif.
Filed Nov. 13, 1987, Ser. No. 121,764
Term of patent 14 years
U.S. Cl. D19—26



311,419
FOLDER
Marc L. Moor, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Continuation-in-part of Ser. No. 316,103, Feb. 27, 1989, which is a continuation-in-part of Ser. No. 247,992, Sep. 22, 1988. This application May 1, 1989, Ser. No. 346,093
Term of patent 14 years
U.S. Cl. D19—27

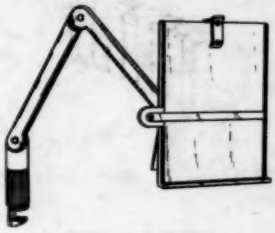


311,420
FOLDER FLAP
Marc L. Moor, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Continuation-in-part of Ser. No. 247,992, Sep. 22, 1988. This application Feb. 27, 1989, Ser. No. 316,103
Term of patent 14 years
U.S. Cl. D19—32

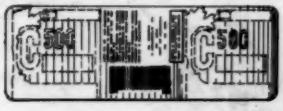


311,421
COMBINED WRITING INSTRUMENT GRIP AND ERASER HOLDER
Jerry S. Mardock, P.O. Box 745, Ukiah, Calif. 95482
Filed Dec. 18, 1987, Ser. No. 136,172
Term of patent 14 years
U.S. Cl. D19—55

311,422
TABLE-MOUNTABLE ADJUSTABLE COPY HOLDER
Fritz Striter, Unterm Bamberg 1, D-5882 Meinerzhagen, Fed. Rep. of Germany
Filed Apr. 14, 1987, Ser. No. 38,344
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1986, MR641
Term of patent 14 years
U.S. Cl. D19—88



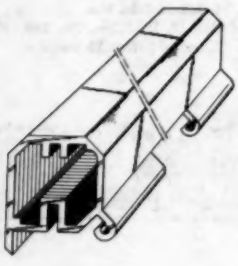
311,423
DUAL-FACED CONTAINER LABEL
Carl DeSantis, Fort Lauderdale, Fla., assignor to Sundown Vitamins, Inc., Ft. Lauderdale, Fla.
Filed Oct. 28, 1988, Ser. No. 264,190
Term of patent 14 years
U.S. Cl. D20—22



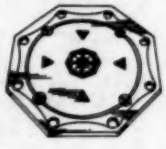
311,424
LABEL FOR GOLF EQUIPMENT
James P. Hess, 3204-6 Meadow Ave., Norman, Okla. 73071
Filed Feb. 24, 1988, Ser. No. 159,653
Term of patent 14 years
U.S. Cl. D20—22

311,425
DISPLAY STAND FOR ENCOURAGING CHILDREN TO BRUSH THEIR TEETH
Tom E. Lindsay, 1037 SW. Lake Front Rd., Lake Oswego, Oreg. 97034
Filed Mar. 15, 1988, Ser. No. 169,331
Term of patent 14 years
U.S. Cl. D20—21

311,426
FRAME ELEMENT FOR MOUNTING OF SALES PROMOTION AND ADVERTISING EQUIPMENT
Willy Ytter, 508, Tak Shing House, 20, des Voeux Rd., Central, Hong Kong
Filed Aug. 4, 1987, Ser. No. 81,439
Term of patent 14 years
U.S. Cl. D20—43

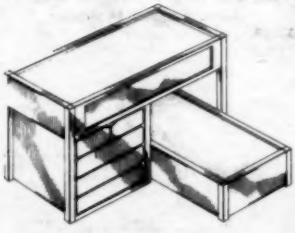


311,427
OCTAGONAL CAME BOARD
Paul Banerjee, 30 Harley Road, Leeds LS13 4QF, England
Filed Oct. 21, 1987, Ser. No. 110,965
Claims priority, application United Kingdom, Apr. 23, 1987, 1041705
Term of patent 14 years
U.S. Cl. D21—20



311,428
GAMING MACHINE OR SIMILAR ARTICLE
John L. Sears, West Bridgford, England, assignor to Bell-Fruit Manufacturing Company Limited, Lenton, England
Filed Mar. 29, 1988, Ser. No. 174,624
Claims priority, application United Kingdom, Oct. 31, 1987, 1045973
Term of patent 14 years
U.S. Cl. D21—37

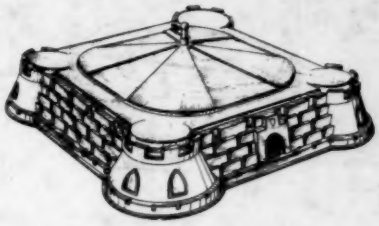
311,429
DOLL BED
Richard L. Steele, 3933 E. Shangri-La, Phoenix, Ariz. 85028
Filed Feb. 8, 1988, Ser. No. 153,036
Term of patent 14 years
U.S. Cl. D21—123



311,430
DOLL
Patricia L. Paris, San Diego, Calif., assignor to Northern Financial Corporation, Anderson, Ind.
Filed Jun. 3, 1987, Ser. No. 57,833
Term of patent 14 years
U.S. Cl. D21—174

311,431
COMBINED GOLF TEE MARKER AND RECEPTACLE
Howard E. Weber, P.O. Box 68, Morning Sun, Iowa 52640
Filed Jun. 20, 1988, Ser. No. 208,646
Term of patent 14 years
U.S. Cl. D21—234

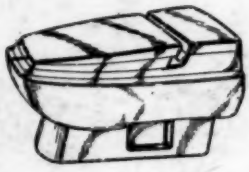
311,432
COMBINED TOY SAND BOX AND LID
Donald F. Cattoni, Warwick, R.I., assignor to Spang & Company, Butler, Pa.
Filed Jan. 15, 1988, Ser. No. 144,868
Term of patent 14 years
U.S. Cl. D21—252



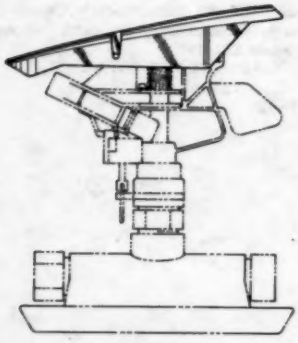
311,433
FISHING LURE
John T. Pottger, R.R. #3, Aston, Ontario, Canada K0A 1BO, and Joseph A. A. Sabourin, 42 Binscarth Crescent, Kanata, Ontario, Canada K2L 1S1
Filed Dec. 23, 1987, Ser. No. 137,473
Term of patent 14 years
U.S. Cl. D22—126

311,434
DOWNRIGGER BALL CRADLE
Stanley M. Bennett, 70 W. Buck Way, Coupeville, Wash. 98239
Continuation of Ser. No. 280,811, Jan. 17, 1989. This application Aug. 31, 1989, Ser. No. 400,956
Term of patent 14 years
U.S. Cl. D22—199

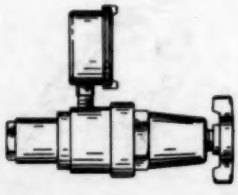
311,435
FLUSH TOILET OR SIMILAR ARTICLE
Wen-Chin Cheng, Hua Lien, Taiwan, assignor to Hocheng Pottery Mfg. Co., Ltd., China
Filed Mar. 13, 1987, Ser. No. 25,771
Term of patent 14 years
U.S. Cl. D23—301



311,436
DEFLECTOR FOR AN IMPULSE SPRINKLER
Stephen P. Whitehead, Elgin, Ill., assignor to Suncast Corporation, Batavia, Ill.
Filed Jun. 29, 1988, Ser. No. 213,981
Term of patent 14 years
U.S. Cl. D23—214



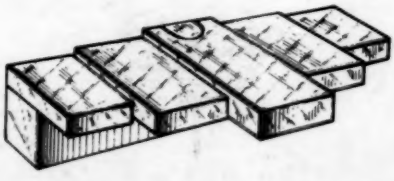
311,437
GAS PRESSURE REGULATOR
Bishnu P. Datta, and David G. Anderson, both of Florence, S.C., assignors to L-TEC, Florence, S.C.
Filed Apr. 18, 1988, Ser. No. 182,589
Term of patent 14 years
U.S. Cl. D23—233



311,438
FAUCET SET
Joseph Strignano, New York, N.Y., assignor to I.W. Industries, N.Y.
Filed Apr. 16, 1987, Ser. No. 39,643
Term of patent 14 years
U.S. Cl. D23—242

311,439
FAUCET HANDLE OR THE LIKE
Herbert V. Kohler, Jr., Kohler, Wis., and Paul P. Kolada, Bexley, Ohio, assignors to Kohler Co., Kohler, Wis.
Division of Ser. No. 820,200, Jan. 16, 1986. This application May 1, 1989, Ser. No. 334,651
Term of patent 14 years
U.S. Cl. D23—250

311,440
FAUCET
Joseph Strignano, New York, N.Y., assignor to I.W. Industries, Melville, N.Y.
Filed Apr. 16, 1987, Ser. No. 39,651
Term of patent 14 years
U.S. Cl. D23—241

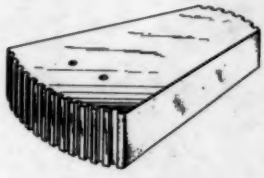


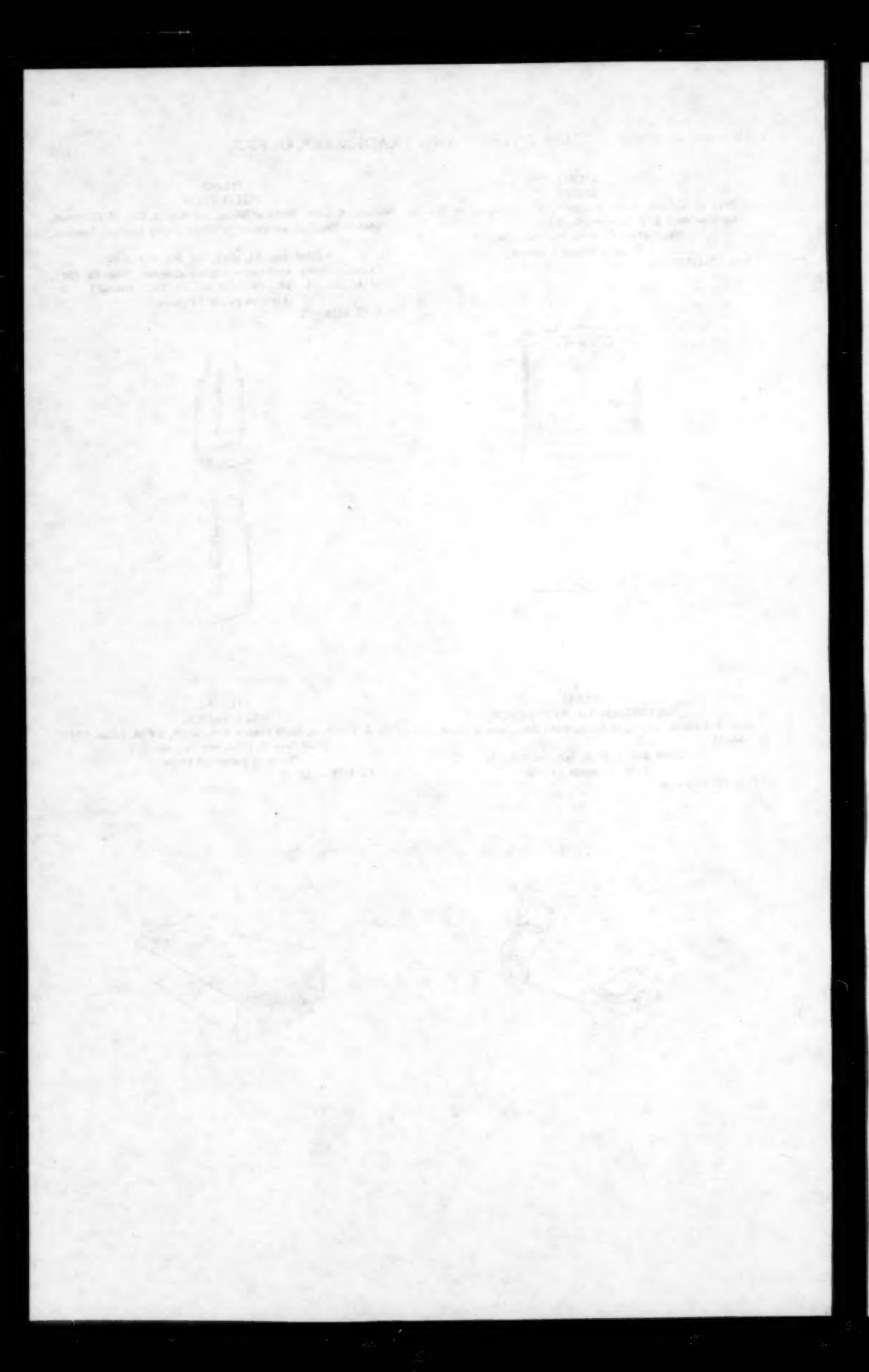
311,441
STOVE
Jeffrey P. Greene, West Kingston, R.I., assignor to Nu-Tec Incorporated, East Greenwich, R.I.
Filed Mar. 17, 1988, Ser. No. 169,338
Term of patent 14 years
U.S. Cl. D23—346

311,442
ORTHODONTIC APPLIANCE
John A. Collins, Jr., 1116 Mishawaka Ave., South Bend, Ind. 46615
Filed Jan. 4, 1988, Ser. No. 140,324
Term of patent 14 years
U.S. Cl. D24—16

311,443
INHALATOR
Norman A. Long, Hayling Island, and Karl A. Garrill, Hertford, both of England, assignors to Glaxo Group Limited, London, England
Filed Aug. 13, 1987, Ser. No. 85,602
Claims priority, application United Kingdom, Feb. 23, 1987, 1040186; Jul. 31, 1987, 1043853; Jul. 31, 1987, 1043852
Term of patent 14 years
U.S. Cl. D24—62

311,444
WALL BLOCK
Paul J. Forsberg, 7600 France Ave. South, Edina, Minn. 55435
Filed Nov. 8, 1985, Ser. No. 804,357
Term of patent 14 years
U.S. Cl. D25—113





LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF OCTOBER, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. J. Weiner, Inc.: *See*—
Shaver, Paul J.; Madden, Patrick; and Michasiow, Allan, 4,964,075, Cl. 364-900.000.

A.R.M. Design Development: *See*—
Jones, Arthur B.; and Cherbonnier, Thomas D., 4,962,817, Cl. 175-5.000.

A. Stucki Company: *See*—
Wiebe, Donald, 4,962,861, Cl. 213-75.00R.

ABB Power T & D Company: *See*—
Medlin, Roger E., 4,963,820, Cl. 324-142.000.

ABB Power T&D Company, Inc.: *See*—
Owen, Timothy C.; Borgmeyer, Virgil L.; and Adkins, Herbert S., 4,963,696, Cl. 174-50.000.
Pavlik, Norman M.; Sefko, John; and Miller, Richard A., 4,963,199, Cl. 148-307.000.

Abbott Laboratories: *See*—
Brooks, Dee W.; and Basha, Anwer, 4,963,541, Cl. 514-183.000.
DeBernardis, John F.; and Zelle, Robert E., 4,963,563, Cl. 514-307.000.
Schoenleber, Robert W.; Kebabian, John W.; Martin, Yvonne C.; DeNinno, Michael P.; Perner, Richard J.; Stout, David M.; Hsiao, Chi-Nung W.; DiDomenico, Stanley, Jr.; DeBernardis, John F.; Basha, Fatima Z.; Meyer, Michael D.; and De, Biswanath, 4,963,568, Cl. 514-320.000.

Abdel-Malik, Magdy M.: *See*—
Yalpani, Manssur; and Abdel-Malik, Magdy M., 4,963,664, Cl. 536-18.700.

Abe, Akira: *See*—
Fujita, Yoshihiro; Ueda, Shinji; Ishikawa, Takatoshi; and Abe, Akira, 4,963,474, Cl. 430-393.000.

Abe, Hayao: *See*—
Nagai, Yoshitaka; Shibayama, Shohei; Numata, Masaaki; Yoshimura, Shoji; Tanaka, Makoto; Ito, Masayoshi; Awaya, Akira; Kobayashi, Hisashi; Abe, Hayao; Ishizuka, Yusaku; and Ogawa, Tomoya, 4,963,653, Cl. 530-322.000.

Abe, Kazuyoshi: *See*—
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, 4,962,917, Cl. 269-56.000.

Abe, Kiyoshi: *See*—
Okabayashi, Seiji; Watanabe, Hirofumi; Abe, Kiyoshi; and Ogawa, Masahide, 4,963,519, Cl. 502-63.000.

Abe, Kunihiro; and Kobayashi, Tomoya, to Fuji Jukogyo Kabushiki Kaisha. Diagnosis system for a motor vehicle. 4,964,049, Cl. 364-431.010.

Abernathy, Donald A. Leak detection and multispectral survey system. 4,963,742, Cl. 250-338.500.

Abiko, Toshio: *See*—
Matsuo, Masayuki; Abiko, Toshio; Ueno, Yoshiaki; and Kanda, Minoru, 4,963,892, Cl. 343-700.0MS.

Abiomed, Inc.: *See*—
Kung, Robert T. V.; Moutafis, Timothy E.; and Ochs, Burt D., 4,962,765, Cl. 128-736.000.

Abramowitz, Jay S.: *See*—
Buchanan, Alan M.; Abramowitz, Jay S.; and Flygare, Roberta A. Y., 4,963,425, Cl. 428-212.000.

ABS Pumpen AG: *See*—
Blum, Albert, 4,963,777, Cl. 310-68.00A.

Abt, John: *See*—
Jackson, Richard A.; and Abt, John, 4,963,977, Cl. 358-22.000.

Actor, James M., to Baldwin SPM, Inc. Apparatus for adapting a single sheet feed offset duplicator to print and collate continuous form paper. 4,962,704, Cl. 101-142.000.

Adachi, Takuya; Ito, Sukenori; Shiosaka, Akihiro; Yuzawa, Atsushi; Takada, Masaaki; Okano, Kiichiro; Kurihara, Masaru; and Uchiyama, Hiromitsu, to Toppan Printing Co., Ltd. Sterilizing apparatus. 4,963,335, Cl. 422-302.000.

Adamek, Manfred: *See*—
Durr, Heinrich; and Adamek, Manfred, 4,963,043, Cl. 400-196.000.

Adams, John Q. Swarm lure package. 4,962,857, Cl. 206-443.000.

Adams, Michael J.: *See*—
Westbrook, Leslie D.; and Adams, Michael J., 4,964,134, Cl. 372-45.000.

Adamski, Joseph R.; Ferguson, Christopher; Prifti, William E.; and Nothe, William E., to Raytheon Company. Diode laser soldering system. 4,963,714, Cl. 219-121.630.

Adkins, Herbert S.: *See*—
Owen, Timothy C.; Borgmeyer, Virgil L.; and Adkins, Herbert S., 4,963,696, Cl. 174-50.000.

Adler, Michael S.; and Pattanayak, Deva N., to General Electric Company. Lateral insulated gate bipolar transistors with improved latch-up immunity. 4,963,951, Cl. 357-23.700.

Adney, Billy R.; Alworth, Charles W.; Durkee, John B.; and Jeffries, Bryce T., to Conoco Inc. Mass flowmeter apparatus. 4,962,666, Cl. 73-223.000.

Adolph Coors Company: *See*—
Jesch, Norman L., 4,963,126, Cl. 493-354.000.

Advanced Micro Devices, Inc.: *See*—
Agrawal, Om P.; Ilgenstein, Kerry A.; Wright, Michael J.; Moench, Jerry D.; and Khu, Arthur H., 4,963,768, Cl. 307-465.000.
Haskell, Jacob D., 4,964,143, Cl. 357-23.500.

Aerospace Corporation, The: *See*—
Lipeles, Russell A.; and Coleman, Dianne J., 4,963,390, Cl. 427-110.000.

Affaitati, Peitro; Affaitati, Rosario; Sannino, Luigi; and Sannino, Bruno, to IMS-International Medical Service S.r.l. Double-chambered container for liquids. 4,962,852, Cl. 206-222.000.

Affaitati, Rosario: *See*—
Affaitati, Peitro; Affaitati, Rosario; Sannino, Luigi; and Sannino, Bruno, 4,962,852, Cl. 206-222.000.

Affeldt, Jeannine L.: *See*—
Roels, Timothy J.; and Affeldt, Jeannine L., 4,963,446, Cl. 429-94.000.

Afify, Manal E.: *See*—
Tyrrell, Raymond E.; and Afify, Manal E., 4,964,095, Cl. 370-55.000.

AG Communication Systems Corporation: *See*—
Belanger, Thomas D., Jr., 4,964,019, Cl. 361-401.000.

Agee, John M.; and King, Francis, to Agee, John M. Surgical method. 4,962,770, Cl. 128-898.000.

Agee, John M.; and King, Francis, to John M. Agee. Surgical instrument. 4,963,147, Cl. 606-170.000.

Agee, John O. Stress and torque reducing tool and method. 4,963,078, Cl. 417-545.000.

Agency of Industrial Science & Technology: *See*—
Ichimura, Kunihiro; Suzuki, Yasuzo; Seki, Takahiro; Sakuragi, Masako; Tamaki, Takashi; Hosoki, Akira; and Aoki, Koso, 4,963,448, Cl. 430-20.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Matejec, Reinhart; Buscher, Ralf; and Langen, Hans, 4,963,465, Cl. 430-506.000.

Agilis Corporation: *See*—
Nease, Greg A.; and Cripps, Peter K., 4,964,138, Cl. 375-1.000.

Agrawal, Om P.; Ilgenstein, Kerry A.; Wright, Michael J.; Moench, Jerry D.; and Khu, Arthur H., to Advanced Micro Devices, Inc. Flexible, programmable cell array interconnected by a programmable switch matrix. 4,963,768, Cl. 307-465.000.

Aharoni, Shaul M.; and Morgan, Robert C., to Allied-Signal. Polyamide/polyester graft copolymer fibers and method of preparing same. 4,963,311, Cl. 264-210.800.

Ahern, Brian S.; and Hilton, Robert M., to United States of America, Air Force. High temperature heat pipe coracle and process. 4,963,334, Cl. 422-249.000.

Ahlstromforetagen Svenska AB: *See*—
Ryham, Rolf, 4,963,231, Cl. 203-22.000.

Ahn, Kang H.: *See*—
Liu, Benjamin Y. H.; and Ahn, Kang H., 4,962,776, Cl. 134-11.000.

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Kohno, Mitsunori; Umebara, Takao; Kurimoto, Yukuo; Fujii, Nobuhiko; and Akita, Hiromasa, 4,963,721, Cl. 235-462.000.

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Churchouse, Stephen J.; and Scamans, Elizabeth M., 4,963,490, Cl. 435-240.241.

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Fiat, Amos, 4,964,164, Cl. 380-30.000.

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Arena, Blaise J.; and Arnold, Edward C., 4,963,382, Cl. 426-548.000.
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Bokareva, Elvina Z.; Schinkorenko, Jelena V.; Terenko, Viktor V.; Nosova, Larisa A.; Faidel, Garri I.; Nurmuchomedov, Sijar N.; Beljakov, Anatolij V.; Vlasov, Ivan M.; Fuerst, Anton; Herrmann, Heinz; Pantzer, Eckart; Stoehrer, Bernhard; Uhland, Eberhard; and Werner, Hans, 4,963,650, Cl. 528-481.000.

Alonso, Jose A. P.: *See*—
Goldstein, Samuel A.; and Alonso, Jose A. P., 4,963,350, Cl. 424-73.000.

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Umemoto, Toshiaki, 4,964,123, Cl. 371-12.000.

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Saito, Osamu, 4,963,732, Cl. 250-231.130.

Alsur Enterprises Ltd.: *See*—
Brown, Ronald O., 4,963,031, Cl. 366-2.000.

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Gatz, Christiane; Altschmied, Joachim; Gassen, Hans G.; and Hillen, Wolfgang, 4,963,488, Cl. 435-233.000.

Alumni Patents Foundation: *See*—
Daniel, Thomas M.; and Hahn, Seung S., 4,963,128, Cl. 600-7.000.

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Adney, Billy R.; Alworth, Charles W.; Durkee, John B.; and Jeffries, Bryce T., 4,962,666, Cl. 73-223.000.

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Pozzi, Oscar A., 4,962,606, Cl. 42-70.080.

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Ambrose, Wilfred G. Apparatus and method for testing parameters of involute gears and pinions. 4,962,590, Cl. 33-501.140.

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Wang, Hwa-Chi; Montgomery, Donnel; Wen, Horng-Yuan; and Kasper, Gerhard, 4,962,673, Cl. 73-864.730.

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Larwin, Renee M. Z.; Keen, Richard D., Jr.; and Zeno, Joseph R., 4,963,071, Cl. 414-723.000.

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Stockton, Gerald W.; Chidester, Dale H.; and Ehrlich, Susan J., 4,963,499, Cl. 436-147.000.
Tseng, Shin S.; Brabander, Herbert J.; Baker, Jannie S.; and Epstein, Joseph W., 4,963,552, Cl. 514-253.000.
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Ames, Matthew M.: *See*—
Kinder, David H.; and Ames, Matthew M., 4,963,655, Cl. 530-331.000.

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Zardi, Umberto; and Pagani, Giorgio, 4,963,338, Cl. 423-360.000.

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Fenoglio, David J.; Song, Yoon S.; and Basalay, Robert J., 4,963,277, Cl. 252-51.50A.
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Kelly, Michael C.; and Lindsay, Richard O., 4,964,102, Cl. 367-47.000.
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So, Bernard Y. C.; and Marker, Terry L., 4,963,250, Cl. 208-426.000.

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Clark, Robert E.; Novak, Robert L.; and Amos, Dennis R., 4,962,586, Cl. 29-889.200.

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Myer, John M.; Grzybowski, Richard W.; and Kane, Thomas J., 4,963,098, Cl. 439-76.000.
Wendling, Hannes J.; and Bouda, Harald, 4,963,106, Cl. 439-595.000.

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Bertrand, Keith J., 4,963,867, Cl. 341-60.000.
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Rodkey, L. Scott; and Huff, G. David, 4,963,236, Cl. 204-183.200.

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Anderson, Martin L. Motorized carpet and tile stripping tool. 4,963,224, Cl. 156-584.000.

Anderson, Thomas G. Golf putter head with adjustable weight cylinder. 4,962,932, Cl. 273-171.000.

Ando Electric Co., Ltd.: *See*—
Sato, Masaichi; and Imazeki, Hideo, 4,963,004, Cl. 350-403.000.
Suzuki, Noriyuki; and Asai, Hiromobu, 4,964,074, Cl. 364-900.000.

Ando, Setsuo: *See*—
Ushio, Jiro; Miyazawa, Osamu; Tomizawa, Akira; Yokono, Hitoshi; Kanda, Naoya; Matsuura, Naoko; Ando, Setsuo; and Okudaira, Hiroaki, 4,963,974, Cl. 357-80.000.

Andou, Hirokazu; Shimomura, Tatsuhiko; and Kikuchi, Hiroshi, to Oki Electric Industry Co., Ltd. Method of producing a movable part of a wire-dot print head. 4,962,876, Cl. 228-193.000.

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Tilders, Benno; and Leuchte, Michael, 4,962,617, Cl. 51-170.0PT.

Andreoli, Paolo: *See*—
Neri, Armando; and Andreoli, Paolo, 4,962,771, Cl. 131-282.000.

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Spillman, William B.; and Andressen, Richard P., 4,963,729, Cl. 250-227.210.

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Sekiguchi, Atsushi; Kobayashi, Tsukasa; and Takagi, Shinji, 4,963,423, Cl. 428-209.000.

Anis, Aziz Y. Flexible one-piece posterior chamber lens and method of implanting the same. 4,963,149, Cl. 623-6.000.

Anju, Shinji, to Sony Corporation. Display apparatus for a group education system. 4,963,097, Cl. 434-431.000.

Annamalai, Kadiresan. Receiver synchronization in encoder/decoder. 4,964,142, Cl. 375-118.000.

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Kodato, Setsuo; and Nakamura, Masao, 4,963,195, Cl. 136-225.000.

Anstalt Agenda: *See*—
Fitz, Alexander, 4,962,974, Cl. 312-333.000.

ANT Nachrichtentechnik GmbH: *See*—
Messor, Grahame, 4,964,116, Cl. 375-11.000.

Antoine, Philippe: *See*—
Marchand, Roger; Antoine, Philippe; L'Haridon, Paul; and Laurent, Yves, 4,964,016, Cl. 361-321.000.

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Anzen Motor Car Co., Ltd.: *See*—
Hirano, Akira; Watanabe, Shinichi; Fukuda, Yutaka; Higuchi, Yukio; Shibano, Fumio; Sekino, Hiroshi; Nabeshima, Hiroichi; and Nishizawa, Yukimasa, 4,962,664, Cl. 73-118.100.

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Aoki, Ken: *See*—
Takizawa, Takashi; Ohshimizu, Kiyoshi; Aoki, Ken; Nakano, Hirotaka; and Kuribara, Hiroyuki, 4,962,648, Cl. 62-199.000.

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Sato, Mitsuo; Aoki, Toshikazu; Takamatsu, Yukishige; and Ryoke, Hideyasu, 4,963,639, Cl. 528-72.000.

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Takagi, Masami; and Aoyagi, Masahiko, 4,963,785, Cl. 313-318.000.

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Miyasaka, Katsuyuki; and Aoyagi, Takuo, 4,964,010, Cl. 361-18.000.

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Kumano, Akira; Sugiura, Yumiko; and Aoyama, Chiaki, 4,964,044, Cl. 364-419.000.

Aoyama, Tomoo; and Murayama, Hiroshi, to Hitachi, Ltd.; and Hitachi Computer Engineering Co., Ltd. Vector processor capable of high-speed access to processing results from scalar processor. 4,964,035, Cl. 364-200.000.

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Appelmann, Wolfgang, to Siemens Aktiengesellschaft. Method for monitoring the quality of a digital signal in sections of a data transmission circuit. 4,964,112, Cl. 370-13.000.

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Okarma, Thomas B.; Clark, Brian R.; Lerch, L. Bernard; and Chang, Chin-Hai, 4,963,265, Cl. 210-638.000.

Applied Industrial Materials Corporation: *See*—
Ellenbaum, Frank H.; and Ciesco, Richard, 4,963,185, Cl. 75-323.000.

Aqua Dynamics Group Corp.: *See*—
Morse, Dwain, 4,963,268, Cl. 210-739.000.

Aquarium Pharmaceuticals, Inc.: *See*—
Goldstein, Joel M.; and O'Malley, Thomas M., 4,963,431, Cl. 428-288.000.

Arai, Izumi: *See*—
Horiuchi, Takao; Arai, Izumi; and Tahara, Yoshifumi, 4,963,713, Cl. 219-121.430.

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Yamauchi, Yasuhiro; Arakawa, Yoshihisa; Fujima, Yukihisa; Takenaga, Kiyomasa; and Hino, Hirokazu, 4,962,711, Cl. 110-347.000.

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Koda, Masatoshi; and Araki, Kazuyuki, 4,963,108, Cl. 440-81.000.

Araki, Yasuaki: *See*—
Nagasawa, Shigeru; Noziri, Hisao; Nakai, Yoshizumi; Araki, Yasuaki; Sakamoto, Eizo; Yagasaki, Masao; and Kozima, Mutsumi, 4,963,611, Cl. 524-459.000.

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Arena, Blaise J.; and Arnold, Edward C., to Allied-Signal Inc. Reduced calorie D-aldohexose monosaccharides. 4,963,382, Cl. 426-548.000.

Argaud, Albert. Exothermic package body having a layer containing a medicinal component. 4,963,360, Cl. 424-443.000.

Arimatsu, Yoshikazu: *See*—
Mitamura, Hideyuki; Arimatsu, Yoshikazu; Tani, Katsuya; and Katsuo, Kenichi, 4,963,310, Cl. 264-205.000.

Arimoto, Naoki: *See*—
Suzuki, Ikuo; Yoneda, Takao; Tsujiuchi, Toshio; and Arimoto, Naoki, 4,963,805, Cl. 318-569.000.

Arita, Yoshinobu: *See*—
Sato, Masaaki; and Arita, Yoshinobu, 4,963,242, Cl. 204-298.310.

Arizona Technology Development Corporation (ATDC): *See*—
Szilagyi, Miklos N., 4,963,748, Cl. 250-396.00R.

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Felegi, John, Jr.; and Kehrer, Kenneth P., 4,963,603, Cl. 524-13.000.

Arnold, David: *See*—
Kowalczyk, Karen B.; Arnold, David; Castongnay, Roger N.; and Yu, Yuet-Ying, 4,963,849, Cl. 335-201.000.

Arnold, Edward C.: *See*—
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Arnold, Hans: *See*—
Reiche, Carl-Heinz; and Arnold, Hans, 4,962,944, Cl. 280-775.000.

Asahi Denka Kogyo Kabushiki Kaisha: *See*—
Uchida, Yasuzo; Nagasaki, Hitoshi; Yamamoto, Goro; and Koyama, Keiji, 4,963,370, Cl. 426-7.000.

Asahi Kogaku Kogyo K.K.: *See*—
Shindo, Osamu; and Hayakawa, Masahiro, 4,963,913, Cl. 354-406.000.

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Negishi, Kiyoshi; Negoro, Ikuo; and Kita, Masahiro, 4,963,941, Cl. 355-282.000.

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Kitajima, Tadayuki; Asakawa, Toshiyuki; Naito, Masataka; Matsuo, Kazuhiro; and Murayama, Toshiaki, 4,962,920, Cl. 271-293.000.

Asano, Toshio: *See*—
Kawame, Keisuke; Asano, Toshio; and Mochizuki, Jun, 4,963,828, Cl. 324-404.000.

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Nishimura, Joji; Mototani, Yuji; Asaoka, Junichi; Yanagawa, Noriyuki; and Touma, Hiroshi, 4,963,447, Cl. 429-206.000.

ASGCO Manufacturing, Inc.: *See*—
Gibbs, A. Todd, 4,962,845, Cl. 198-499.000.

Ashenfelder, Jack E., Jr. Apparatus for deflecting fluids leaking around pump shafts. 4,962,937, Cl. 277-68.000.

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Ashley, Walter L., Jr.; Jansen, Daniel F.; and Meyer, George Y., Jr., to Kelsey-Hayes Company. Method of making a wheel rim. 4,962,587, Cl. 29-894.350.

Aspex Limited: *See*—
Ling, William, 4,963,015, Cl. 352-57.000.

Associated Mills Inc.: *See*—
Stern, Richard J.; and Kempiak, Donald J., 4,962,759, Cl. 128-66.000.

AT&T Bell Laboratories: *See*—
Chapin, J. Thomas; Hardee, Addison G., Jr.; Larsson-Moss, Lisa M.; Leahe, Charles M.; Overton, Bob J.; Shea, John W.; Taylor, Carl R.; and Turnipseed, John M., 4,962,992, Cl. 350-96.230.
Chi, Ignacio; and Fang, Wei-Chou, 4,963,161, Cl. 29-623.500.
Desurvire, Emmanuel; Giles, Randy C.; and Whalen, Matthew S., 4,963,832, Cl. 330-4.300.
Friend, Frank H.; and Lin, Kon-Mang, 4,962,905, Cl. 248-125.000.
LeGrange, Jane D., 4,962,985, Cl. 350-96.150.
Savage, Dale A.; and Spencer, Sidney H., 4,964,020, Cl. 361-429.000.

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Stansfeld, James W.; and Atkinson, David I. H., 4,962,671, Cl. 73-861.370.

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Levine, Robert A.; and Croke, William M., 4,962,661, Cl. 73-1.00H.

Atlantic Vacuum Parts Corp.: *See*—
Genoa, Joseph; Kaskel, Harold; and Nelson, Carl, 4,963,100, Cl. 439-191.000.

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Kaup, Ludger, 4,962,653, Cl. 70-107.000.

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Braga, Vittorio; Manica, Michele; Martini, Emilio; and Milani, Federico, 4,963,612, Cl. 524-477.000.

Ausonics Pty. Ltd.: *See*—
Bui, Tuan; Chan, Helen L. W.; and Unsworth, Joe, 4,963,782, Cl. 310-358.000.

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AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof.Dr.Dr.h.c. Hans List: *See*—
Andreas, Bilek, 4,962,735, Cl. 123-52.0MV.

Awai, Ikuo: *See*—
Konishi, Yoshihiro; Konno, Kenichi; Awai, Ikuo; and Hikuma, Hideo, 4,963,844, Cl. 333-208.000.

Awano, Yuji, to Fujitsu Limited. Semiconductor device having level shift diode. 4,963,948, Cl. 357-16.000.

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Nagai, Yoshitaka; Shibayama, Shohei; Numata, Masaaki; Yoshimura, Shoji; Tanaka, Makoto; Ito, Masayoshi; Awaya, Akira; Kobayashi, Hisashi; Abe, Hayao; Ishizuka, Yusaku; and Ogawa, Tomoya, 4,963,653, Cl. 530-322.000.

Awazu, Hiroshi: *See*—
Awazu, Toshifumi; and Awazu, Hiroshi, 4,962,933, Cl. 273-186.00C.

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Ayasli, Yalcin, to Hittite Microwave Corporation. Low pass/high pass filter phase shifter. 4,963,773, Cl. 307-511.000.

Ayers, Donald J., to Boeing Company, The. Method for debulking precured thermoplastic composite laminae. 4,963,215, Cl. 156-286.000.

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Azumatani, Yasushi: *See*—
Satoh, Isao; Ichinose, Makoto; Fukushima, Yoshihisa; Kuroki, Yuzuru; Takagi, Yuji; and Azumatani, Yasushi, 4,964,094, Cl. 369-59.000.

B. F. Goodrich Company, The: *See*—
DiRienzo, David J., 4,963,634, Cl. 526-344.100.
Sharaby, Zaev, 4,963,592, Cl. 521-56.000.

B & G Machinery: *See*—
Wiatt, James G.; Swiderski, Kevin J.; Belcher, Samuel L.; and Smith, Roger D., 4,963,086, Cl. 425-526.000.

Baars, Dirk M.: *See*—
Harvey, Andrew C.; Lusignea, Richard W.; Racich, James L.; Baars, Dirk M.; Bretches, Donald D.; and Davis, Robert B., 4,963,428, Cl. 428-220.000.

Baba, Keizo, to Ricoh Company, Ltd. Facsimile device. 4,963,988, Cl. 358-296.000.

Babcock Industries Inc.: *See*—
Wendt, Robert O.; Holt, Steven T.; and Schneider, Gordon L., 4,963,050, Cl. 403-197.000.

Bachar, Raphael. Floor rag clamp. 4,962,563, Cl. 15-147.00R.

Bachman, Joseph L., Jr.: *See*—
Johnson, A. David, Jr.; and Bachman, Joseph L., Jr., 4,962,625, Cl. 53-157.000.

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Bachot, Jean; and Le Roux, Olivier, to Rhone-Poulenc Chimie. Electrolytic production of quinone from hydroquinone. 4,963,234, Cl. 204-78.000.

Backscheider, Frank A.; and Rogers, Paul, to United States Medical Corporation; and Recto Molded Products, Inc. Laser surgery plume evacuator with aspirator. 4,963,134, Cl. 604-319.000.

Backstrom, Reijo J.; Heinola, Kalevi E.; Honkanen, Erkki J.; Kaakkola, Seppo K.; Kairisalo, Pekka J.; Linden, Inge-Britt Y.; Mannisto, Pekka T.; Nissinen, Erkki A. O.; Pohto, Pentti; Pippuri, Aino K.; and Pystynen, Jarmo J., to Orion-yhtyma Oy. Pharmacologically active compounds, methods for the preparation thereof and compositions containing the same. 4,963,590, Cl. 514-678.000.

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Bacon, David L.: *See*—
Zellaha, Dennis D.; and Bacon, David L., 4,962,600, Cl. 37-280.000.

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Lesher, George Y.; Bacon, Edward R.; Singh, Baldev; and Kuo, Gee-Hong, 4,963,561, Cl. 514-303.000.

Badger, Alison M.; Cheeseman, Elaine N.; DiMartino, Michael J.; Dorman, James W.; Mirabelli, Christopher K.; Picker, Donald H.; and Schwartz, David A., to SmithKline Beecham Corporation. Immunomodulatory azaspiranes. 4,963,557, Cl. 514-278.000.

Bahar, Bamdad: *See*—
Witkowski, Gregory; Bahar, Bamdad; and Wolbrom, Irving M., 4,963,261, Cl. 210-490.000.

Bailey, Paul E.; and Rauf, Shahid, to PPG Industries, Inc. Method for making glass fiber mats using controllable fiber glass strand feeders. 4,963,176, Cl. 65-4.400.

Bailey, Thomas F.; and Todd, Raymond A., Jr., to Drilex Systems, Inc. Mud saver valve with replaceable inner sleeve. 4,962,819, Cl. 175-218.000.

Bair, Eugene C.; and Burke, Frederick C., to General Electric Company. Method of operating apparatus. 4,963,391, Cl. 427-116.000.

Baird, William C., Jr.; Riley, Kenneth L.; and Swan, George A., III, to Exxon Research & Engineering Company. Reforming using novel platinum-tin alumina catalysts. 4,963,249, Cl. 208-139.000.

Baker Hughes Incorporated: *See*—
Berzin, Vel, 4,962,812, Cl. 166-187.000.
Perricone, Alphonse C.; Clapper, Dennis K.; and Enright, Dorothy P., 4,963,273, Cl. 252-8.510.

Baker, Jannie S.: *See*—
Tseng, Shin S.; Brabander, Herbert J.; Baker, Jannie S.; and Epstein, Joseph W., 4,963,552, Cl. 514-253.000.

Baker, Robert D.: *See*—
Ubhayakar, Shivadev K.; and Baker, Robert D., 4,964,062, Cl. 364-513.000.

Baker, Stephen R.; Jamieson, William B., deceased (National Westminster Bank, Farnham Trustee and Investment Bank, executors); and Todd, Alec, to Lilly Industries Limited. Organic compounds and their pharmaceutical use. 4,963,578, Cl. 514-381.000.

Baldwin, Leon M. Bore cleaning tool. 4,962,607, Cl. 42-95.000.

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Actor, James M., 4,962,704, Cl. 101-142.000.

Baliga, Bantval J.: *See*—
Chang, Hsueh-Rong; and Baliga, Bantval J., 4,963,950, Cl. 357-23.400.

Ball, Larry K.; and Hines, Marshall U., to Allied-Signal Inc. Butterfly valve apparatus and method. 4,962,783, Cl. 137-1.000.

Balzarini, Jan M. R.: *See*—
de Clercq, Erik D. A.; Herdewijn, Piet A. M. M.; Broder, Samuel; and Balzarini, Jan M. R., 4,963,533, Cl. 514-49.000.

Bambacigno, Ralph: *See*—
Lindquist, Thomas R.; and Bambacigno, Ralph, 4,963,082, Cl. 425-117.000.

Ban, Tomohiro: *See*—
Kawakami, Yasushi; Hirata, Keiichi; Kamisaka, Mizuho; Mukai, Miyako; Ban, Tomohiro; and Ooishi, Misoru, 4,963,042, Cl. 400-17.000.

Bando Chemical Industries, Ltd.: *See*—
Watanabe, Katuki; and Minamimure, Mamoru, 4,963,308, Cl. 264-159.000.

Bannai, Yuichi, to Canon Kabushiki Kaisha. Image reader/editor with operator interaction. 4,963,996, Cl. 358-453.000.

Barbaras, Gerard A. A.: *See*—
Broughton, Peter; Berthin, Jean-Claude; Martin, Jean G. M.; and Barbaras, Gerard A. A., 4,963,058, Cl. 405-207.000.

Barbaro-Forleo, Marco: *See*—
Marciano-Agostinelli, Fabrizio; Barbaro-Forleo, Marco; Cinquemani, Paul L.; and Buckweitz, Michael D., 4,963,695, Cl. 174-23.00C.

Barbetta, Angelo J.: *See*—
Laing, John R.; Chang, Hui; Manca, Richard D.; and Barbetta, Angelo J., 4,963,455, Cl. 430-106.600.

Barcomb, Lyle B.; and El-Hindi, Lawrence, to Filter Tech Inc. Sludge dewatering filter press. 4,963,259, Cl. 210-386.000.

Barker, Ronald C., to Lex Computer and Management Corporation. Video composition method and apparatus employing visual and tactile feedback. 4,964,004, Cl. 360-14.100.

Barksby, Nigel, to Union Carbide Chemicals and Plastics Company Inc. Acid containing isocyanate-terminated prepolymers, salt prepolymers and polymers thereof. 4,963,637, Cl. 528-59.000.

Barnett, Ralph L.; Schmid, Steven R.; and Kaplan, Robert, to Triodyne Inc. Minimum energy curb negotiating wheelchair. 4,962,942, Cl. 280-5.280.

Baroid Technology, Inc.: *See*—
Coope, Daniel F.; and Fontenot, John E., 4,964,085, Cl. 367-35.000.

Barreto, Aurelio F.; and Paxman, Darrell R. Insulated shelter for pet animals and method of manufacture thereof. 4,962,729, Cl. 119-19.000.

Barrier, James M.: *See*—
Davis, H. O.; and Barrier, James M., 4,963,301, Cl. 264-29.700.

Barry, Ralph J., Jr.: *See*—
Noddin, Richard A.; Madenjian, Arthur R.; and Barry, Ralph J., Jr., 4,963,313, Cl. 264-573.000.

Barton, Kenneth R.: *See*—
Tortorici, Frank J.; Barton, Kenneth R.; and Queen, Lawrence D., 4,963,652, Cl. 524-604.000.

Basalay, Robert J.: *See*—
Fenoglio, David J.; Song, Yoon S.; and Basalay, Robert J., 4,963,277, Cl. 252-51.50A.

Basey, Gary D.: *See*—
Mallory, Robert L.; Basey, Gary D.; and Gainer, Robert L., 4,964,018, Cl. 361-391.000.

BASF Aktiengesellschaft: *See*—
Merger, Franz; Fischer, Rolf; Harder, Wolfgang; Priester, Claus-Ulrich; and Vagt, Uwe, 4,963,672, Cl. 540-538.000.
Merger, Franz; Fischer, Rolf; and Priester, Claus-Ulrich, 4,963,673, Cl. 540-538.000.
Schmidt-Hellerau, Christof; and Mayer, Johann, 4,963,599, Cl. 523-211.000.
Seele, Rainer; Karbach, Stefan; Kober, Reiner; Zipplies, Matthias; Sauter, Hubert; Moore, Barbara A.; Carlson, Dale R.; Zorner, Paul S.; Westphalen, Karl-Otto; and Wuerzer, Bruno, 4,963,690, Cl. 548-264.800.

Basha, Anwer: *See*—
Brooks, Dee W.; and Basha, Anwer, 4,963,541, Cl. 514-183.000.

Basha, Fatima Z.: *See*—
Schoenleber, Robert W.; Kebabian, John W.; Martin, Yvonne C.; DeNinno, Michael P.; Perner, Richard J.; Stout, David M.; Hsiao, Chi-Nung W.; DiDomenico, Stanley, Jr.; DeBernardis, John F.; Basha, Fatima Z.; Meyer, Michael D.; and De, Biswanath, 4,963,568, Cl. 514-320.000.

Bass Pro Shops, Inc.: *See*—
Bleam, Richard J.; Keller, Ronald C.; and Keller, David N., 4,962,610, Cl. 43-42.530.

Battenfeld Automatisierungstechnik GmbH: *See*—
Heindl, Friedrich; Schnuecker, Franz; and Huber, Anton, 4,963,302, Cl. 264-40.400.

Battocletti, Bart. Energy conserving refrigerated fixture. 4,962,649, Cl. 62-256.000.

Bauer, Klaus: *See*—
Willms, Lothar; Kehne, Heinz; Bauer, Klaus; and Bieringer, Hermann, 4,963,180, Cl. 71-92.000.

Baughman, Ray H.: *See*—
Shacklette, Lawrence W.; Jen, Kwan-Yue; Eckhardt, Helmut; Elsenbaumer, Ronald L.; and Baughman, Ray H., 4,963,206, Cl. 156-99.000.

Baumann, Gerhard: *See*—
Amann, Markus-Christian; Thulke, Wolfgang; and Baumann, Gerhard, 4,963,507, Cl. 437-130.000.

Baxter International Inc.: *See*—
Stefan, Michael S., 4,962,757, Cl. 128-.26..

Bayer Aktiengesellschaft: *See*—
Lunkenheimer, Winfried; Brandes, Wilhelm; and Hanssler, Gerd, 4,963,548, Cl. 514-237.500.
Szentivanyi, Zsolt; Obrecht, Werner; and Wassen, Jurgen, 4,963,621, Cl. 525-207.000.
Wollweber, Detlef; Brandes, Wilhelm; and Dutzmann, Stefan, 4,963,181, Cl. 71-95.000.

Bayerische Motoren Werke AG: *See*—
Schurk, Hans-Eberhard, 4,964,076, Cl. 364-900.000.

Bayley, Brian J.: *See*—
Quan, Ronald; and Bayley, Brian J., 4,963,756, Cl. 250-568.000.

Bays, David E.: *See*—
North, Peter C.; Oxford, Alexander W.; Cavalla, David J.; and Bays, David E., 4,963,546, Cl. 514-214.000.

Baz, Dan G.: *See*—
Bonjour, Jacques L.; and Baz, Dan G., 4,963,222, Cl. 156-393.000.

Beam, Dennis A., Jr.: *See*—
Sarazen, Paul M., Jr.; and Beam, Dennis A., Jr., 4,962,882, Cl. 236-49.500.

Beard, Hoyt S.: *See*—
White, Jackie L.; Grubbs, Robert E.; Beard, Hoyt S.; Raker, Mark L.; Perfetti, Thomas A.; and Haberkern, Richard G., 4,962,773, Cl. 131-291.000.

Beaujean, Hans-Josef; Eisenblaetter, Horst; Fues, Johann F.; Giesen, Brigitte; Holz, Erich; Jahnke, Ulrich; Kuenzel, Werner; Meffert, Alfred; Schwadtke, Karl; Smulders, Eduard; Sung, Eric; Sykiatk, Andreas; Toelkes, Hans-Georg; and Wegener, Ingo, to Henkel Kommanditgesellschaft auf Aktien. Machine washing process for soiled textile articles. 4,963,158, Cl. 8-137.000.

Beccaria, Giuseppe; Fava, Enzo; and Manfredini, Giuseppe. Portable device for the storage of water under pressure supplied, when drawn, as a broken forced jet. 4,962,888, Cl. 239-152.000.

Beck, Leonard H.: *See*—
Liss, Theodor A.; and Beck, Leonard H., 4,963,409, Cl. 428-96.000.

Becker, Richard A.: *See*—
Molnar, Julius J.; and Becker, Richard A., 4,963,392, Cl. 427-180.000.

Beckett, Donald G., to Beckett Industries Inc. Microwave heating material. 4,963,424, Cl. 428-209.000.

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Beckstead, Leo W.; Kearns, Tom C.; and Chou, Eddie C., to AMAX Inc. Purification of APT. 4,963,336, Cl. 423-56.000.

Bednar, Fred H.; and Lunz, Kenneth G., to Westinghouse Electric Corp. Low level detector monitor. 4,963,315, Cl. 376-254.000.

Beekil, Steven L. Modular self-contained orthotic device. 4,962,762, Cl. 128-595.000.

Beery, Jack; and Boyer, David A., to Mead Corporation, The. System for registering to a moving web. 4,963,459, Cl. 430-138.000.

Behringwerke Aktiengesellschaft: *See*—
Schoriemmer, Hans U.; Sedlacek, Hans H.; and Hilfenhaus, Joachim, 4,963,577, Cl. 514-369.000.

Beigler, Myron A.: *See*—
Calenoff, Emanuel; Beigler, Myron A.; Friesen, Gerald L.; and Nichols, James L., 4,963,356, Cl. 424-91.000.

Beiser, Michael A.: *See*—
Appal, Eugene R.; Beiser, Michael A.; and McBroom, James P., 4,962,864, Cl. 220-270.000.

Bekki, Keisuke; Yokota, Takayoshi; Nagai, Tooru; and Hamada, Nobuhiro, to Hitachi, Ltd. Automatic design system of logic circuit. 4,964,056, Cl. 364-488.000.

Belanger, Thomas D., Jr., to AG Communication Systems Corporation. Multilayer bonding and cooling of integrated circuit devices. 4,964,019, Cl. 361-401.000.

Belcher, Bryan L., to Rolls-Royce plc. Heat exchanger. 4,962,809, Cl. 165-101.000.

Belcher, Samuel L.: *See*—
Wiatt, James G.; Swiderski, Kevin J.; Belcher, Samuel L.; and Smith, Roger D., 4,963,086, Cl. 425-526.000.

Belcour, Beatrice; Courtois, Didier; and Ehret, Charles, to Roure S.A. Process for the preparation of gamma-irone. 4,963,480, Cl. 435-42.000.

Belinko, Keith; Khulbe, Chandra P.; and Jain, Anil K., to Petro-Canada Inc. Hydrocracking of heavy oil in presence of ultrafine iron sulphate. 4,963,247, Cl. 208-112.000.

Beljakov, Anatolij V.: *See*—
Bokareva, Elvina Z.; Schinkorenko, Jelena V.; Terenko, Viktor V.; Nosova, Larisa A.; Faidel, Garri I.; Nurmuchomedov, Sijar N.; Beljakov, Anatolij V.; Vlasov, Ivan M.; Fuerst, Anton; Herrmann, Heinz; Pantzer, Eckart; Stoehrer, Bernhard; Uhland, Eberhard; and Werner, Hans, 4,963,650, Cl. 528-481.000.

Bell Communications Research, Inc.: *See*—
Andreadakis, Nicholas C., 4,963,114, Cl. 445-25.000.

Bell, Laurence D., to Transfresh Corporation. Systems for cleaning and cooling produce. 4,962,777, Cl. 134-63.000.

Bell, Leslie D.; Mayer, Ernest J.; Palmier, Mark O.; Tolunay, H. Eser; Warren, Thomas G.; and Wun, Tze-Chein, to Monsanto Company. Tissue plasminogen activator modified by the substitution of Arg for Cys at position 73, methods and pharmaceutical compositions therefor. 4,963,357, Cl. 424-94.640.

Bell, Weldon K.: *See*—
Audeh, Costandi A.; and Bell, Weldon K., 4,963,340, Cl. 423-444.000.

Belliveau, Richard S.; Floyd, Michael R.; and Tulk, Steven E. Variable color lighting system. 4,962,687, Cl. 84-464.00R.

Bendix France: *See*—
Kervagoret, Gilbert, 4,962,975, Cl. 303-116.000.

Benedikt, Walter; Friese, Karl-Hermann; Herden, Werner; Schuldt, Dietrich; and Steinke, Leo, to Robert Bosch GmbH. Method of production of a spark plug for internal combustion engines. 4,963,112, Cl. 445-7.000.

Beneking, Heinz, to Telefunken Electronic GmbH. Semiconductor array. 4,963,947, Cl. 357-4.000.

Benenson, Jay: *See*—
Gering, George; and Benenson, Jay, 4,963,314, Cl. 273-183.00R.

Benoit, Gordon L., to Mobil Oil Corporation. Method for forming particle-impregnated one-sided cling stretch wrap film. 4,963,388, Cl. 427-29.000.

Benscoter, Kenneth. Emergency water reservoir. 4,962,789, Cl. 137-571.000.

Benson, David K.: *See*—
Tracy, C. Edwin; and Benson, David K., 4,963,012, Cl. 350-641.000.

Bercaw, Robert M. Insulating electromagnetic shielding resin composition. 4,963,291, Cl. 252-512.000.

Bergen, Richard F.: *See*—
Gundlach, Robert W.; and Bergen, Richard F., 4,963,738, Cl. 250-326.000.

Berger, Terry A., to Hewlett-Packard Company. Supercritical fluid chromatography. 4,962,662, Cl. 73-23.420.

Bernadic, Thomas J.: *See*—
Kathi, Karl; Patterson, John H.; Lowe, Tony M.; Val, Yefim; Bernadic, Thomas J.; and Brockett, Brendan L., 4,963,061, Cl. 407-114.000.

Berry, Allan D.: *See*—
Ferguson, Stephen P.; and Berry, Allan D., 4,964,122, Cl. 370-102.000.

Berry, Thomas G., to Motorola, Inc. Method and apparatus for controlling access to a communication system. 4,964,163, Cl. 380-23.000.

Berthin, Jean-Claude: *See*—
Broughton, Peter; Berthin, Jean-Claude; Martin, Jean G. M.; and Barbaras, Gerard A. A., 4,963,058, Cl. 405-207.000.

Bertok, Bela: *See*—
Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo ; Soos, Ruldof; Radvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, 4,963,584, Cl. 514-521.000.

Bertrand, Keith J., to Ampex Corporation. Apparatus for packing parallel data words having a variable width into parallel data words having a fixed width. 4,963,867, Cl. 341-60.000.

Beru Reprecht GmbH & Co. KB: *See*—
Niessner, Werner, 4,963,784, Cl. 313-131.00R.

Berzin, Vel, to Baker Hughes Incorporated. Valving system for inflatable packers. 4,962,812, Cl. 166-187.000.

Besic, Dragan; and Smith, Wilbur C., to Dresser Industries, Inc. Profiled plunger for a reciprocating pump. 4,963,077, Cl. 417-437.000.

Best, Glen H.: *See*—
Allen, Floyd L.; Best, Glen H.; and Lindroth, Thomas A., 4,963,668, Cl. 536-114.000.

Bhardwaj, Satish C. Method of cooking involving high protein frying batter that eliminates the need for breading and produces crispy and chewy crust. 4,963,378, Cl. 426-302.000.

Bhattacharyya, Alakananda: *See*—
Yoo, Jin S.; Radlowski, Cecelia A.; Karch, John A.; and Bhattacharyya, Alakananda, 4,963,520, Cl. 502-64.000.

BHN Associates: *See*—
Weston, William, 4,963,351, Cl. 424-73.000.

Biagotti, Guglielmo. Rotary-apparatus for glueing the outer end of a stick of wound paper material. 4,963,223, Cl. 156-456.000.

Bianchi, Jean-Claude: *See*—
Camara, Alpha; and Bianchi, Jean-Claude, 4,962,928, Cl. 273-73.00D.

Bibbee, Russell S.; and Stearns, Robert E., to Precision Carbide Die, Inc. Method and apparatus for applying a dry film drawing lubricant to sheet material. 4,963,400, Cl. 427-374.100.

Bickley, Robert F.: *See*—
Bachmann, Andrew G.; and Bickley, Robert F., 4,963,220, Cl. 156-307.300.

Bieringer, Hermann: *See*—
Willms, Lothar; Kehne, Heinz; Bauer, Klaus; and Bieringer, Hermann, 4,963,180, Cl. 71-92.000.

Bierlein, Gunter; and Salbaum, Helmut, to U.S. Philips Corp. Circuit for storing a speech signal in a digital speech memory. 4,964,168, Cl. 381-36.000.

Biller, Alfred B. Speargun trigger mechanism. 4,962,747, Cl. 124-40.000.

Bilodeau, Francois: *See*—
Najafi, Seyed-Iraj; Hill, Kenneth O.; Bilodeau, Francois; and Johnson, Derwyn C., 4,963,177, Cl. 65-30.130.

Binet, Jean: *See*—
Manoury, Philippe; Binet, Jean; Obitz, Daniel; Defosse, Gerard; Dewitte, Elisabeth; and Veronique, Corinne, 4,963,680, Cl. 544-395.000.

Biotrack: *See*—
Hillman, Robert S.; Cobb, Michael E.; Allen, Jimmy D.; Gibbons, Ian; Ostoich, Vladimir E.; and Winfrey, Laura J., 4,963,498, Cl. 436-69.000.

Birdling, Ian A., to Birdling Industries Limited. Windows and doors. 4,962,615, Cl. 49-381.000.

Birdling Industries Limited: *See*—
Birdling, Ian A., 4,962,615, Cl. 49-381.000.

Birkmann, Angelika; and Bock, August, to Boehringer Mannheim GmbH. DNA for the repressible and inducible expression of foreign genes. 4,963,482, Cl. 435-69.100.

Birrittella, Mark S.; and Wikstrom, Jan A., to Cray Research, Inc. Read-while-write ram cell. 4,964,081, Cl. 365-189.060.

Bishop, Alva J. Self supply automatic ink stamping device. 4,962,703, Cl. 101-334.000.

Bishop, Norman G.; Bottinelli, N. Edward; and Kotraba, Norman L., to Zia Technology, Inc. Continuous feed shaft retort process for recovery of non-ferrous metals from process dust. 4,963,182, Cl. 75-590.000.

Bitetto, Mark F.: *See*—
Janko, Bozidar; Sekulic, Zoran O.; and Bitetto, Mark F., 4,963,821, Cl. 324-158.00P.

Bjerke, Robert K.; Ward, James P.; Ells, Delbert O.; and Kees, Kenneth P., to Blount, Inc. Primer composition. 4,963,201, Cl. 149-2.000.

Black & Decker, Inc.: *See*—
Lentino, Lynn E.; and Turner, Terry L., 4,963,779, Cl. 310-71.000.

Blackburn, David W. J.: *See*—
Gill, Michael D.; Blackburn, David W. J.; and Saunders, Malcolm P., 4,963,924, Cl. 355-77.000.

Blackmon, James B.; and Edwards, Don, to McDonnell Douglas Corporation. Apparatus and method for calculation of shape factor. 4,963,025, Cl. 356-376.000.

Blain, David A.; Cardia, Angeline B.; and McGonigle, Sylvia S., to Mobil Oil Corporation. Lubricant and fuel compositions containing reaction products of polyalkenyl succinimides, aldehydes, and triazoles. 4,963,278, Cl. 252-51.50A.

Blair, Kevin B., to GTE Mobilnet Incorporated. Cellular telephone unit capable of automatic interaction with audio services. 4,964,156, Cl. 379-189.000.

Blanchard, Pierre; and Carquet, Michel, to Thomson-CSF. Charge transfer device and method for producing such a device. 4,963,953, Cl. 357-24.000.

Blankenship, Betty A.: *See*—
Ekin, John W.; Panson, Armand J.; and Blankenship, Betty A., 4,963,523, Cl. 505-1.000.

Blase, Gunter. Chain link for a power-supply chain. 4,962,639, Cl. 59-78.100.

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Blind, Andre: *See*—
Robin, Jean; and Blind, Andre, 4,963,675, Cl. 544-222.000.

Blinka, Thomas A.: *See*—
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Bloom, Leonard: *See*—
Cromrich, John; and Cromrich, Lynn B., 4,963,305, Cl. 264-60.000.

Blount, Inc.: *See*—
Bjerke, Robert K.; Ward, James P.; Ells, Delbert O.; and Kees, Kenneth P., 4,963,201, Cl. 149-2.000.

Blum, Albert, to ABS Pumpen AG. Submersible electromotor with internal voltage selector switch. 4,963,777, Cl. 310-68.00A.

Blume, Ingo; and Pinnau, Ingo, to Membrane Technology & Research, Inc. Composite membrane, method of preparation and use. 4,963,165, Cl. 55-16.000.

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Rodkey, L. Scott; and Huff, G. David, 4,963,236, Cl. 204-183.200.

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Krishnamurthy, Ramachandran; Malik, Virginia A.; and Stokley, Alan G., 4,963,339, Cl. 423-437.000.
Layden, Lawrence M., 4,962,891, Cl. 239-597.000.
Rathbone, Thomas, 4,962,646, Cl. 62-24.000.

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Bock, Jan; and Valint, Paul L., to Exxon Research and Engineering Company. Mixed micellar process for preparing hydrophobically associating polymers. 4,963,632, Cl. 526-240.000.

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Mattes, Ralf; Lenz, Helmut; and Stock, Werner, 4,963,469, Cl. 435-7.000.

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Ayers, Donald J., 4,963,215, Cl. 156-286.000.
Falk, R. Aaron, 4,963,869, Cl. 341-83.000.
Fortes, Rudy F., 4,962,902, Cl. 244-75.00R.
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Boger, Manfred; Drabek, Jozef; Ehrenfreund, Josef; and Kristiansen, Odd, to Ciba-Geigy Corporation. Substituted thioureas, isothioureas and carbodiimides and use as pesticide. 4,963,550, Cl. 514-249.000.

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Reilly, James L.; and Bohen, Joseph M., 4,963,607, Cl. 524-291.000.

Bohm, Gunter; Schieleit, Jurgen; Braun, Detlev; Pater, Heinz-Georg; Kobbing, Heinz; and Buchter, Hubert, to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung e.V. Apparatus for sorting and distributing mail pieces. 4,963,251, Cl. 209-564.000.

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Bond, William H.; and Yi, Alex C., to Rockwell International Corporation. Heat exchanger. 4,962,810, Cl. 165-143.000.
Bonjour, Jacques L.; and Baz, Dan G., to Maillefer S.A. Installation for manufacture of multi-strand electric cable. 4,963,222, Cl. 156-393.000.
Bononi, Walter H., to Marwitz & Hauser. Protective spectacles. 4,963,013, Cl. 351-114.000.
Boppart, Loren P., to Mayrath Industries, Inc. Grain hopper assembly. 4,963,066, Cl. 414-376.000.
Borchard, Hans-Jurgen, to Henning Berlin GmbH. Apparatus for dispensing a controlled dose of a liquid fluid. 4,962,868, Cl. 222-49.000.
Borg-Warner Chemicals, Inc.: *See*—
Grant, Thomas S.; and Jalbert, Ronald L., 4,963,620, Cl. 525-68.000.
Borgmeyer, Virgil L.: *See*—
Owen, Timothy C.; Borgmeyer, Virgil L.; and Adkins, Herbert S., 4,963,696, Cl. 174-50.000.
Borsotti, Giampietro: *See*—
Tu, Chin-Yun J.; Clark, George W.; and Borsotti, Giampietro, 4,963,679, Cl. 544-357.000.
Borthwick, Alan D.: *See*—
Semeraro, Claudio; Micheli, Dino; Pieraccioli, Daniele; Gaviraghi, Giovanni; and Borthwick, Alan D., 4,963,571, Cl. 514-356.000.
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Botar, Sandor: *See*—
Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo ; Soos, Ruldof; Radvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, 4,963,584, Cl. 514-521.000.
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Bishop, Norman G.; Bottinelli, N. Edward; and Kotraba, Norman L., 4,963,182, Cl. 75-590.000.
Botto, Paolo; and Freschi, Claudio, to W. R. Grace & Co.-Conn. Multilayer packaging film. 4,963,427, Cl. 428-215.000.
Bouda, Harald: *See*—
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Heijnemans, Werner A. L.; and Bouwhuis, Gijsbertus, 4,963,016, Cl. 353-74.000.
Bowden, Raymond D., III; Salas, Edward R.; Sanfacon, Marc E.; and Somers, Jeffrey S., to Bull HN Information Systems Inc. Memory controller with error logging. 4,964,129, Cl. 371-40.200.
Bowden, Raymond D., III; Salas, Edward R.; Sanfacon, Marc E.; and Somers, Jeffrey S., to Bull HN Information Systems Inc. System for determining status of errors in a memory subsystem. 4,964,130, Cl. 371-40.200.
Bowman, Harold M. Multicomponent wales and bases for manhole cover supports. 4,963,053, Cl. 404-26.000.
Boyd, David: *See*—
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Beery, Jack; and Boyer, David A., 4,963,459, Cl. 430-138.000.
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Tseng, Shin S.; Brabander, Herbert J.; Baker, Jannie S.; and Epstein, Joseph W., 4,963,552, Cl. 514-253.000.
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Landis, William R.; and Bradford, Peter, 4,963,752, Cl. 250-459.100.
Bradley, John J., to Paper Converting Machine Company. Web winding machine and method. 4,962,897, Cl. 242-67.10R.
Braga, Vittorio; Manica, Michele; Martini, Emilio; and Milani, Federico, to Ausimont S.r.l. Plastoelastomeric polyolefinic compositions and process for preparing them according to dynamic vulcanizable methods. 4,963,612, Cl. 524-477.000.
Brammer, Hartmut: *See*—
Brand, Gunter; Brammer, Hartmut; Gerber, Richard; Glockler, Otto; Grimm, Gerold; Gruber, Hans-Ulrich; Gunther, Dieter; Issler, Jorg; Kalippke, Harald; Lolhoffel, Wolfgang; Maurer, Helmut; Mayer, Ulrich; Plapp, Gunther; Renninger, Erhard; Ruppmann, Claus; Sailer, Harald; and Werner, Peter, 4,962,737, Cl. 123-339.000.
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Brand, Reinhold; Engler, Bernd; Kleine-Moellhoff, Peter; and Koberstein, Edgar, to Degussa Aktiengesellschaft. Method for the catalytic removal of nitrogen oxides from exhaust gases by means of a reducing agent. 4,963,332, Cl. 423-235.000.
Brandel, Charles W.; Kim, San; Wiecek, Charles S.; and Heinze, Richard F., to Food Materials Corporation. Microwave popcorn bag with unpopped kernels separator screen. 4,963,374, Cl. 426-107.000.
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Wollweber, Detlef; Brandes, Wilhelm; and Dutzmann, Stefan, 4,963,181, Cl. 71-95.000.
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Hoetzl, Max; Brandewie, James A.; and Lingle, Thomas M., 4,963,091, Cl. 432-176.000.
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Brattan, Keith; Nevin, Morris N.; and Kelham, Stephen F., to Imperial Chemical Industries plc. Process for treating electrolytic cell products. 4,963,235, Cl. 204-98.000.
Brattan, Keith, to Imperial Chemical Industries PLC. Electrolytic cell with recirculation means. 4,963,241, Cl. 204-237.000.
Brauman, Daniel. Implantable prosthetic devices. 4,963,150, Cl. 623-8.000.
Braun, Detlev: *See*—
Bohm, Gunter; Schieleit, Jurgen; Braun, Detlev; Pater, Heinz-Georg; Kobbing, Heinz; and Buchter, Hubert, 4,963,251, Cl. 209-564.000.
Braun, Hans: *See*—
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Braun, Martin: *See*—
Klostermann, Heinrich F.; and Braun, Martin, 4,964,148, Cl. 378-127.000.
Braun, Nohl A., Jr.; and Urling, Mary J. Neo-natal net. 4,963,138, Cl. 604-356.000.
Braun, Rolf; Dorn, Alfred; and Muller, Joachim, to MAN Roland Druckmaschinen. Densitometric sensing device for use in printing presses. 4,963,028, Cl. 356-445.000.
Braun, Stephen A.; O'Neill, Michael J.; Curry, Roger W.; Titze, James R.; Niosi, Donald E.; Fujikawa, Tetsuzo; Hirata, Makizo; and Nishimura, Michio, to Deere & Company. Edger. 4,962,631, Cl. 56-17.200.
Brent Chemicals International plc: *See*—
Higgins, George L., 4,963,198, Cl. 148-267.000.
Bresci, Bruno: *See*—
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Bressan, Joelle; and Mezon, Jacques, to Gaz de France (Service National). Corrosion inhibitors of steels and aqueous compositions of alkali meal halide containing them. 4,963,290, Cl. 252-387.000.
Bretches, Donald D.: *See*—
Harvey, Andrew C.; Lusignea, Richard W.; Racich, James L.; Baars, Dirk M.; Bretches, Donald D.; and Davis, Robert B., 4,963,428, Cl. 428-220.000.
Breuer, Hans: *See*—
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Breveglieri, Frank L., to Geerpres, Inc. Clasp for retaining containers. 4,962,573, Cl. 24-573.100.
Brida, Pius, to IWC International Watch Co. AG. Wristwatch. 4,964,092, Cl. 368-282.000.
Bridgestone Corporation: *See*—
Kishii, Ryuji; and Takemiya, Akinori, 4,963,085, Cl. 425-385.000.
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Ueda, Hiroshi; Yoshigai, Hisaaki; and Masunaga, Mikio, 4,962,804, Cl. 152-454.000.
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Bridgewater, Jon D., to R. H. Peterson Company. Remote control of gas fireplace burner. 4,962,750, Cl. 126-503.000.
Brink's Incorporated: *See*—
Gunn, William L.; Heath, William D., Jr.; and Mantovani, John C., 4,963,118, Cl. 453-3.000.
Brinks, Michael J.: *See*—
DeHaan, Daniel; Brinks, Michael J.; and Steketee, Sherwood, 4,963,255, Cl. 210-230.000.
Bristol-Myers Squibb Co.: *See*—
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British Gas plc: *See*—
Dickinson, Alan J.; and Stafford, Trevor G., 4,963,421, Cl. 428-36.900.
British Telecommunications plc: *See*—
Gill, Michael D.; Blackburn, David W. J.; and Saunders, Malcolm P., 4,963,924, Cl. 355-77.000.
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Doran, Nicholas J., 4,962,987, Cl. 350-96.150.
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Brockett, Brendan L.: *See—*
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Broder, Samuel: *See—*
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Broderick, John; Jones, Peter; and Squitieri, Vincent, to Chomerics, Inc. Treadle assembly. 4,963,705, Cl. 200-86.00R.

Broderick, Kevin: *See—*
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Bromfield, George, to Edo Corporation, Western Division. Flextensional sonar transducer assembly. 4,964,106, Cl. 367-165.000.

Brooks, Dee W.; and Basha, Anwer, to Abbott Laboratories. Pyrimidopyrimidine lipoxygenase inhibiting compounds. 4,963,541, Cl. 514-183.000.

Brooks, Gary T.: *See—*
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Brooks, Michael T.; and Cherry, Craig D., to Spectra-Physics. Bar code scanner and method of scanning. 4,963,719, Cl. 235-462.000.

Brooks, Royce L., to Koerner, Norman D. Evacuation chair. 4,963,762, Cl. 297-183.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Kawakami, Yasushi; Hirata, Keiichi; Kamisaka, Mizuho; Mukai, Miyako; Ban, Tomohiro; and Ooishi, Minoru, 4,963,042, Cl. 400-17.000.
Yoshihara, Hideo, 4,963,918, Cl. 355-19.000.

Broughton, Peter; Berthin, Jean-Claude; Martin, Jean G. M.; and Barbaras, Gerard A. A., to Doris Engineering. Protective barrier for the protection of offshore marine works, and method of installation of the same. 4,963,058, Cl. 405-207.000.

Brown, David R.; Frost, Charles E., Jr.; and White, Kenneth A., to GTE Products Corporation. Apparatus for making quartz glass crucibles. 4,963,178, Cl. 65-144.000.

Brown, Dennis N., to Northwest Podiatric Laboratory, Inc. Orthotic and method of making of the same. 4,962,593, Cl. 36-44.000.

Brown, Robert J., Jr., to Square D Company. Power management and automation system. 4,964,058, Cl. 364-492.000.

Brown, Ronald O., to Alsur Enterprises Ltd. Cement slurry batcher apparatus and process. 4,963,031, Cl. 366-2.000.

Brown, Thomas W.: *See—*
Thomasson, James S.; Williams, Elwood L., Jr.; Bryant, Barry L.; Curtis, Cynthia H.; and Brown, Thomas W., 4,962,774, Cl. 131-309.000.

Brownlee, Kenneth G., to Hewlett-Packard Company. LED illuminator bar for copier. 4,963,933, Cl. 355-218.000.

Brownlee, Robert R., to Cardiac Control Systems, Inc. Pacemaker catheter. 4,962,767, Cl. 128-786.000.

Bryan, Philip S.; Lambert, Patrick M.; Towers, Christine M.; and Jarrold, Gregory S., to Eastman Kodak Company. X-ray intensifying screen including a titanium activated hafnium dioxide phosphor containing gadolinium to reduce afterglow. 4,963,753, Cl. 250-483.100.

Bryan, Philip S.; Lambert, Patrick M.; Towers, Christine M.; and Jarrold, Gregory S., to Eastman Kodak Company. X-ray intensifying screen including a titanium activated hafnium dioxide phosphor containing thulium to reduce afterglow. 4,963,754, Cl. 250-483.100.

Bryant, Barry L.: *See—*
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Bryant, Judson D. Fastening mechanism. 4,963,410, Cl. 428-100.000.

Buchanan, Alan M.; Abramowitz, Jay S.; and Flygare, Roberta A. Y., to Unisys Corporation. Printed wiring board substrate for surface mounted components. 4,963,425, Cl. 428-212.000.

Buchter, Hubert: *See—*
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Budd, Russell A.; Goddard, Joan S.; and Stanich, Mikel J., to International Business Machines Corporation. Multiple laser beam scanning optics. 4,963,900, Cl. 346-160.000.

Budin, Jean-Pierre: *See—*
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Buell Industries, Inc.: *See—*
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Bugg, Richard E. F.; and Metheringham, Nigel, to U.S. Philips Corporation. Method and apparatus for validating teletext data. 4,963,968, Cl. 358-147.000.

Buhler, Frederick T., to Conrac SCD, Inc. Method and apparatus for dynamic magnetic field neutralization. 4,963,789, Cl. 315-8.000.

Bui, Tuan; Chan, Helen L. W.; and Unsworth, Joe, to Ausonics Pty. Ltd. Multifrequency composite ultrasonic transducer system. 4,963,782, Cl. 310-358.000.

Bull HN Information Systems Inc.: *See—*
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Woods, William E.; Lemay, Richard A.; and Wallace, David A., 4,964,037, Cl. 364-200.000.

Buma, Koji; and Komiya, Fuminori, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Horn switch of steering wheel. 4,963,704, Cl. 200-61.550.

Bumueller, Hermann K. Automatic tailgate assembly. 4,962,966, Cl. 298-23.00R.

Buntain, Ian G.; Hatton, Leslie R.; Hawkins, David W.; Pearson, Christopher J.; and Roberts, David A., to May & Baker Ltd. Derivatives of N-phenylpyrazoles, compositions and use. 4,963,575, Cl. 514-359.000.

Bunthoff, Klaus: *See—*
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Burack, Robert D.; Friedrich, August J.; and Dietrich, Albert J., to Westinghouse Electric Corp. Flow control method for decontaminating radioactively contaminated nuclear steam generator. 4,963,293, Cl. 252-626.000.

Burgess, J. Stuart; Spink, Donald R.; and Stein, Jerry Y., to Turbotak Inc. Gas reacting apparatus and method. 4,963,329, Cl. 422-168.000.

Burke, Frederick C.: *See—*
Bair, Eugene C.; and Burke, Frederick C., 4,963,391, Cl. 427-116.000.

Burle Technologies, Inc.: *See—*
Willoughby, Jon S.; and Perkins, Erik D., 4,963,961, Cl. 358-105.000.

Burnett, David G., to World Computer Corporation. Computer peripheral tester. 4,964,124, Cl. 371-15.100.

Burrell, Donald C.: *See—*
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Burroughs Wellcome Co.: *See—*
Franzmann, Karl W., 4,963,562, Cl. 514-307.000.
Jones, Trevor M.; and White, Alan R., 4,963,555, Cl. 514-262.000.

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Buscher, Ralf: *See—*
Matejec, Reinhart; Buscher, Ralf; and Langen, Hans, 4,963,465, Cl. 430-506.000.

Bush, Harold G.; Mikulas, Martin M., Jr.; and Wallsom, Richard E., to United States of America, National Aeronautics and Space Administration. Mechanical end joint system for connecting structural column elements. 4,963,052, Cl. 403-322.000.

Busse, Bernd: *See—*
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Butke, Betsy J.: *See—*
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Byron, David E., to Red Eye Arms, Inc. Cooling method and apparatus for wings and other fuselage components. 4,962,903, Cl. 244-117.00A.

C. E. Niehoff & Co.: *See—*
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Cablelift Oil Corporation: *See—*
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Caffrey, Stephen F.: *See—*
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Calabria, Ralph; Hartner, Frederick W.; and Sisko, John T., to Merck & Co., Inc. Process for solubilizing polyanoinic bacterial polysaccharides in aprotic solvents. 4,963,534, Cl. 514-54.000.

Calenoff, Emanuel; Beigler, Myron A.; Friesen, Gerald L.; and Nichols, James L., to Minnesota Mining and Manufacturing Company. Stable antigenic extracts methods. 4,963,356, Cl. 424-91.000.

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Janesick, James R., 4,963,952, Cl. 357-24.000.
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Kulka, Robert; and Chandra, Dinesh, 4,963,797, Cl. 315-309.000.
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Clancey, Stephen M., to Eaton Corporation. Viscous damper with low seal drag torque. 4,962,838, Cl. 192-106.100.

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Colucci, Nicholas. Putter head. 4,962,927, Cl. 273-162.00E.

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Watson, James M.; Crabbe, David; and Coursen, Thomas S., Jr., 4,963,343, Cl. 423-594.000.

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Lewis, Everett C.; and Grant, Harley A., 4,963,395, Cl. 427-253.000.

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Laurent, Daniel, 4,963,207, Cl. 156-117.000.

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Huxtable, William P.; Griffith, William L.; and Compere, Alicia L., 4,963,341, Cl. 423-499.000.

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Adney, Billy R.; Alworth, Charles W.; Durkee, John B.; and Jeffries, Bryce T., 4,962,666, Cl. 73-223.000.
Chittineni, Chittibabu, 4,964,088, Cl. 367-51.000.
Johnson, James H., 4,964,103, Cl. 367-53.000.
Wang, Shein S.; Hanson, Douglas W.; and Cavanaugh, Thomas D., 4,964,089, Cl. 367-73.000.
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Buhler, Frederick T., 4,963,789, Cl. 315-8.000.

Conrad, Lee C.: *See*—
Weber, John E.; and Conrad, Lee C., 4,963,170, Cl. 55-311.000.

Consiglio Nazionale Delle Ricerche: *See*—
Cova, Sergio, 4,963,727, Cl. 250-214.00R.

Consolidated Papers, Inc.: *See*—
Mayer, Michael A.; Mason, Lucien L.; Olson, Leonard C.; and Riemer, Keith H., 4,963,397, Cl. 427-356.000.

Continental Aktiengesellschaft: *See*—
Rohde, Dieter, 4,962,802, Cl. 152-532.000.

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Grassel, Wayne E.; and McGranaghan, Mark F., 4,964,055, Cl. 364-485.000.

Cooper, Kelvin; Fray, Michael J.; Richardson, Kenneth; and Steele, John, to Pfizer Inc. 1,4-dihydropyridine derivatives. 4,963,560, Cl. 514-303.000.

Cooper, Robert T. Rupturable chamber gasket. 4,962,938, Cl. 277-201.000.

Coovert, Richard E.: *See*—
King, Christopher N.; and Coovert, Richard E., 4,963,788, Cl. 313-503.000.

Coquard, Jean: *See*—
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Corby, Nelson R., Jr.: *See*—
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Cornell Research Foundation, Inc.: *See*—
Hang, Yong D., 4,963,486, Cl. 435-139.000.
Pollock, Clifford R.; Georgiou, Efstratios T.; and Carrig, Timothy J., 4,964,133, Cl. 372-42.000.

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Khan, Mirza M. T.; and Siddiqui, M. R. H., 4,963,295, Cl. 260-409.000.

Coursen, Thomas S., Jr.: *See*—
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Courser, Incorporated: *See*—
King, Charles, 4,963,731, Cl. 250-560.000.

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Belcour, Beatrice; Courtois, Didier; and Ehret, Charles, 4,963,480, Cl. 435-42.000.

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Shirley, Ronald D.; and Cowan, Michael D., 4,962,901, Cl. 242-323.000.

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Clomburg, Lloyd A., Jr.; and Crenwelge, Otto E., Jr., 4,963,163, Cl. 48-210.000.

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Nease, Greg A.; and Cripps, Peter K., 4,964,138, Cl. 375-1.000.

Croke, William M.: *See*—
Levine, Robert A.; and Croke, William M., 4,962,661, Cl. 73-1.00H.

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Ducheyne, Paul; Topoleski, L. D. Timmie; and Cuckler, John M., 4,963,151, Cl. 623-16.000.

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Perr, Julius P.; Liang, Eric; Yu, Robert C.; and Ghuman, Amarjit S., 4,962,743, Cl. 123-496.000.

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Curt G. Joa, Inc.: *See*—
Miley, Guy M.; and McGuire, Daniel J., 4,963,072, Cl. 414-797.600.

Curtis, Cynthia H.: *See*—
Thomasson, James S.; Williams, Elwood L., Jr.; Bryant, Barry L.; Curtis, Cynthia H.; and Brown, Thomas W., 4,962,774, Cl. 131-309.000.

Curulla, Michael V.: *See*—
Johansson, Eric B.; and Curulla, Michael V., 4,963,318, Cl. 376-446.000.

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Goela, Jitendra S.; Jaworski, Roy D.; and Taylor, Raymond L., 4,963,393, Cl. 427-248.100.

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D.A.M. Deutsche Angelgerate Manufaktur Hellmuth Kuntze GmbH & Co.: *See*—
Dorbandt, Klaus, 4,962,900, Cl. 242-282.000.

Dabroski, Winifred C., to McNeil-PPC, Inc. Absorbent body having hydrophobic insert. 4,963,139, Cl. 604-378.000.

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Kim, Jong R., 4,962,821, Cl. 180-6.480.

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Egashira, Noritaka; and Satake, Naoto, 4,963,522, Cl. 503-227.000.
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Saito, Makoto; Watanabe, Teruo; Yahagi, Shinichiro; Kasai, Yasuaki; Yoshikawa, Norio; Yoshida, Yutaka; Kinami, Toshiya; and Yamada, Hiyoshi, 4,963,320, Cl. 419-12.000.
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Daimler-Benz AG: *See*—
Panten, Detlef; Jegelka, Jurgen; and Schubert, Roland 4,962,643, Cl. 60-288.000.

Dalquist, H. David: *See*—
King, Robert M.; and Dalquist, H. David, 4,962,755, Cl. 128-24.00A.

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Wittmann, Dieter; Lindner, Christian; Damrath, Volker; Kress, Hans-Jurgen; Peters, Horst; and Schoeps, Jochen, 4,963,619, Cl. 525-67.000.

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Kufe, Donald W., 4,963,484, Cl. 435-69.300.

Danby Pty, Ltd.: *See*—
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Jindrick, James A.; Page, L. Dennis; and Daniel, Richard A., 4,964,017, Cl. 361-390.000.

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Danieli & C. Officine Meccaniche SpA: *See*—
Nonini, Geremia, 4,962,655, Cl. 72-21.000.

Danks, Michael J.: *See*—
Traube, Roy F.; and Danks, Michael J., 4,964,160, Cl. 379-412.000.

Danninger Medical Technology, Inc.: *See*—
Shamir, Dan; and Groves, Mark W., 4,962,756, Cl. 128-26.000.

Databook, Inc.: *See*—
Sternglass, Daniel, 4,964,011, Cl. 361-88.000.

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Daugherty, Thomas L., to United States of America, Navy. Vibration reducing thrust bearing. 4,963,039, Cl. 384-224.000.

Dauphin, Michel: *See*—
Calvignac, Jean; Dauphin, Michel; Lenoir, Raymond; and Picard, Jean-Louis, 4,964,127, Cl. 371-37.100.

David, Harold: *See*—
Chavez, Rodrigo G.; David, Harold; Metzner, Ernest K.; Sigler, Gerald F.; and Winn-Deen, Emily S., 4,963,479, Cl. 435-22.000.

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Dussart, Jena-Luc; David, Richard; and Grange, Bruno, 4,962,793, Cl. 139-116.200.

Davis, Bessie A., executrix: *See*—
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Harvey, Andrew C.; Lusignea, Richard W.; Racich, James L.; Baars, Dirk M.; Bretches, Donald D.; and Davis, Robert B., 4,963,428, Cl. 428-220.000.

Davis, Roy I., to Ford Motor Company. Adaptive controller for regenerative and friction braking system. 4,962,969, Cl. 303-3.000.

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Schoenleber, Robert W.; Kebabian, John W.; Martin, Yvonne C.; DeNinno, Michael P.; Perner, Richard J.; Stout, David M.; Hsiao, Chi-Nung W.; DiDomenico, Stanley, Jr.; DeBernardis, John F.; Basha, Fatima Z.; Meyer, Michael D.; and De, Biswanath, 4,963,568, Cl. 514-320.000.

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Schoenleber, Robert W.; Kebabian, John W.; Martin, Yvonne C.; DeNinno, Michael P.; Perner, Richard J.; Stout, David M.; Hsiao, Chi-Nung W.; DiDomenico, Stanley, Jr.; DeBernardis, John F.; Basha, Fatima Z.; Meyer, Michael D.; and De, Biswanath, 4,963,568, Cl. 514-320.000.

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Decibel Products, Inc.: *See*—
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de Clercq, Erik D. A.; Herdewijn, Piet A. M. M.; Broder, Samuel; and Balzarini, Jan M. R., to Stichting Rega VZW (REGA); and United States of America, America. Therapeutic application of dideoxycytidinene. 4,963,533, Cl. 514-49.000.

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Dedic, Ian J., to General Electric Company, p.l.c., The. Amplifiers. 4,963,837, Cl. 330-264.000.

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Braun, Stephen A.; O'Neill, Michael J.; Curry, Roger W.; Titze, James R.; Niosi, Donald E.; Fujikawa, Tetsuzo; Hirata, Makizo; and Nishimura, Michio, 4,962,631, Cl. 56-17.200.
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Manoury, Philippe; Binet, Jean; Obitz, Daniel; Defosse, Gerard; Dewitte, Elisabeth; and Veronique, Corinne, 4,963,680, Cl. 544-395.000.

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Brand, Reinhold; Engler, Bernd; Kleine-Moellhoff, Peter; and Koberstein, Edgar, 4,963,332, Cl. 423-235.000.
Diehl, Walter; and Ringelstein, Hans-Martin, 4,963,184, Cl. 75-247.000.
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Sampei, Keiichi; Dei, Yosihito; Furukawa, Kazuo; Fukumoto, Katsumi; and Kato, Yoshihiro, 4,962,636, Cl. 56-17.100.

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Albertson, Philip E.; and Deken, Arthur D., 4,963,075, Cl. 417-273.000.

Delaney, Norma G., to E. R. Squibb & Sons, Inc. Phosphonate and phosphonamide endopeptidase inhibitors. 4,963,539, Cl. 514-119.000.

Delaney, William C., to Globe-Union Inc. Internal hydrostatic pump for a mobile vehicle battery. 4,963,444, Cl. 429-67.000.

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Clemence, Francois; Le Martret, Odile; Delevallee, Francoise; and Fortin, Michel, 4,963,567, Cl. 514-314.000.

DeLucia, Frank, to Smith International, Inc. Downhole motor with an enlarged connecting rod housing. 4,962,818, Cl. 175-75.000.

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Lafferty, John J.; Demarinis, Robert M.; and Shah, Dinubhai H., 4,963,547, Cl. 514-217.000.

DeMartino, Ronald N.; East, Anthony J.; and Calundann, Gordon W., to Hoechst Celanese Corp. Bisacrylate monomers and polymers exhibiting nonlinear optical response. 4,963,633, Cl. 526-323.200.

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Design Systems, Inc.: *See*—
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Dessauer, Guido, to Hoechst Aktiengesellschaft. Process for the production of a pigment-based agent suitable for the paper and board industry and improving the printability of paper and board. 4,963,192, Cl. 106-499.000.

Desurvire, Emmanuel; Giles, Randy C.; and Whalen, Matthew S., to AT&T Bell Laboratories. Erbium-doped fiber amplifier coupling device. 4,963,832, Cl. 330-4.300.

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Detrick, John E., to Southeast Container Corp. Adjustable equipment rack carrier. 4,963,070, Cl. 414-492.000.

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Dickinson, Alan J.; and Stafford, Trevor G., to British Gas plc. Joining polyolefinic members by fusion. 4,963,421, Cl. 428-36.900.

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Diesel Kiki Co., Ltd.: *See*—
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Fluegel, Theodore D.; and Dishner, Bryan W., 4,963,976, Cl. 357-82.000.

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van Deventer, Ivor G.; and di Somma, Gerrit R. C., 4,962,548, Cl. 4-211.000.

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Fourman, Robert G.; Dixon, Richard P.; and Breuer, Hans, 4,963,591, Cl. 514-944.000.

Dixon, Wilbur. Butt hinge assembly. 4,962,567, Cl. 16-319.000.

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Vajtner, Zlatko; Lopotar, Nevenka; and Djokic, Slobodan, 4,963,528, Cl. 514-29.000.

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Burst, Hermann; and Pross, Walter, 4,962,883, Cl. 237-2.00A.

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Wurl, Willi; Dimson, Benjamin; and Uerlings, Rainer, 4,962,960, Cl. 296-120.100.

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Oi, Naobumi; Kitahara, Hajimu; and Doi, Tadashi, 4,963,254, Cl. 210-198.200.

Dokshus, Kazimeras-Motejus K.: *See*—
Kutra, Sauljus I.; Tokarev, Ian I.; Chinikas, Cheslovas V.; Dokshus, Kazimeras-Motejus K.; and Shileika, Antanas-Sigitas V., 4,962,597, Cl. 37-117.500.

Dolce, Thomas J.: *See*—
Chen, Paul N., Sr.; Harget, Paul J.; and Dolce, Thomas J., 4,963,434, Cl. 428-378.000.

Domagala, Robert F.: *See*—
Wiencek, Thomas C.; Domagala, Robert F.; and Thresh, Henry R., 4,963,317, Cl. 376-422.000.

Domtar Inc.: *See*—
Yalpani, Manssur; and Abdel-Malik, Magdy M., 4,963,664, Cl. 536-18.700.

Donaldson Company, Inc.: *See*—
Osendorf, Richard J., 4,963,171, Cl. 55-355.000.

Donnerhak, Bernd: *See*—
Kotowski, Stephan; Busse, Bernd; and Donnerhak, Bernd, 4,963,244, Cl. 204-400.000.

Doran, Nicholas J., to British Telecommunications public limited company. Optical device producing an intensity dependent phase shift. 4,962,987, Cl. 350-96.150.

Dorbandt, Klaus, to D.A.M. Deutsche Angelgerate Manufaktur Hellmuth Kuntze GmbH & Co. Fishing line reel selectively operated in the right-hand or left-hand mode. 4,962,900, Cl. 242-282.000.

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Harney, Michael; Doremus, Mark; Nussrallah, Steve; Lowcock, Roy; and West, Lamar, Jr., 4,963,966, Cl. 358-349.000.

Doris Engineering: *See*—
Broughton, Peter; Berthin, Jean-Claude; Martin, Jean G. M.; and Barbaras, Gerard A. A., 4,963,058, Cl. 405-207.000.

Dorman, James W.: *See*—
Badger, Alison M.; Cheeseman, Elaine N.; DiMartino, Michael J.; Dorman, James W.; Mirabelli, Christopher K.; Picker, Donald H.; and Schwartz, David A., 4,963,557, Cl. 514-278.000.

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Okuda, Takanari; Nomura, Shigeo; Shibahara, Itaru; Enokido, Yuji; Fujiwara, Masayuki; Nishida, Toshio; Teranishi, Hiroshi; Hirano, Susumu; Iseda, Aturou; and Nakajima, Motoharu, 4,963,200, Cl. 148-325.000.

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Dow Chemical Company, The: *See*—
Dennis, Nicholas; and Burrell, Donald C., 4,963,173, Cl. 71-94.000.
Im, Jang-hi; and Chau, C. C., 4,963,304, Cl. 264-49.000.

Dow, Ian J.: *See*—
Ferrara, Randy; May, Carl D.; and Dow, Ian J., 4,962,955, Cl. 292-216.000.

Dowty Decoto, Inc.: *See*—
Gellerson, Walter G., 4,962,786, Cl. 137-493.600.

Drabek, Jozef: *See*—
Boger, Manfred; Drabek, Jozef; Ehrenfreund, Josef; and Kristiansen, Odd, 4,963,550, Cl. 514-249.000.

Drackett Company, The: *See*—
Hutchings, Richard S.; Nolte, Saundra L.; and Weaver, Jeffrey S., 4,963,287, Cl. 252-187.230.

Dragan, William B. Dental syringe tip and syringe holder therefor. 4,963,093, Cl. 433-90.000.

Dragerwerk Aktiengesellschaft: *See*—
May, Wolfgang, 4,963,324, Cl. 422-60.000.

Drehman, Alvin J., to United States of America, Air Force. Superconductor switch. 4,963,852, Cl. 338-32.00S.

Dresser Industries, Inc.: *See*—
Besic, Dragan; and Smith, Wilbur C., 4,963,077, Cl. 417-437.000.

Drewlo, Kenneth G. Three-dimensional cathode ray tube display. 4,963,959, Cl. 358-88.000.

Driemel, Klaus; Bunthoff, Klaus; Nies, Helmut; and Rohe, Dieter, to Grillo-Werke AG. Copolymers of unsaturated carboxylic acids and use thereof. 4,963,629, Cl. 526-200.000.

Drijfholt, Jacob; and van den Berg, Johannes C. M. Apparatus for refining oils or fats. 4,962,698, Cl. 99-408.000.

Drilex Systems, Inc.: *See*—
Bailey, Thomas F.; and Todd, Raymond A., Jr., 4,962,819, Cl. 175-218.000.

Driskill, Brent J. Backwashing dispenser for air conditioner drain pans. 4,962,778, Cl. 134-169.00C.

Drisko, Robert A.; and Taft, Jeffrey D., to Westinghouse Electric Corp. Vision system with adjustment for variations in imaged surface reflectivity. 4,963,036, Cl. 382-50.000.

Drummy, Michael: *See*—
Torre, John J.; and Drummy, Michael, 4,963,880, Cl. 343-866.000.

DSC Communications Corporation: *See*—
Schrodt, Duane E.; and Wilson, David D., 4,964,105, Cl. 370-16.000.

DSP, Inc.: *See*—
Harris, Gary S., 4,962,599, Cl. 37-266.000.

Dube, William P.: *See*—
Capobianco, Thomas E.; Dube, William P.; and Fizer, Kenneth W., 4,963,826, Cl. 324-202.000.

Ducheyne, Paul; Topoleski, L. D. Timmie; and Cuckler, John M., to University of Pennsylvania, Trustees of the. Reinforced bone cement, method of production thereof and reinforcing fiber bundles therefor. 4,963,151, Cl. 623-16.000.

Dufour, Pierre, to Salomon S. A. Sport shoe sole. 4,962,596, Cl. 36-134.000.

Duggan, Mark E.; and Hartman, George D., to Merck & Co., Inc. 5-oxygenated HMG-CoA reductase inhibitors. 4,963,538, Cl. 514-99.000.

Duh, Ben, to Goodyear Tire & Rubber Company, The. Process for crystallization of polyethylene naphthalate. 4,963,644, Cl. 528-272.000.

Duke University: *See*—
Goesele, Ulrich M.; and Lehmann, Volker, 4,962,879, Cl. 228-116.000.

Dulaney, Eugene L.: *See*—
Currie, Sara A.; Miller, Thomas W.; Dulaney, Eugene L.; Springer, James P.; Valiant, Mary E.; Mochales del Val, Sagrario; and Zimmerman, Sheldon B., 4,963,569, Cl. 514-326.000.

Duncan, Virgil D., to Digital Recorders, Inc. Multi channel digital random access recorder-player. 4,963,866, Cl. 341-110.000.

Dundas, Robert E., to Factory Mutual Research. Apparatus for controlling lubricating oil fires due to oil line failure. 4,962,831, Cl. 184-108.000.

Du Pont de Nemours, E. I., and Company: *See*—
Allen, Steven R.; Mian, Aziz A.; and Samuels, Sam L., 4,963,298, Cl. 264-12.000.
Anderson, Albert G.; Eaton, David F.; Tam, Wilson; and Wang, Ying, 4,962,979, Cl. 350-1.100.
Anderson, Jerrel C.; Gangal, Subhash V.; Kerbow, Dewey L.; and Stewart, Charles W., 4,963,609, Cl. 524-413.000.
Coughlin, Joseph F., 4,963,600, Cl. 523-333.000.
Liss, Theodor A.; and Beck, Leonard H., 4,963,409, Cl. 428-96.000.
Trout, Torence J.; Chan, Dominic M.; and Monroe, Bruce M., 4,963,471, Cl. 430-282.000.

Duriron Company, Inc., The: *See*—
Helferich, Richard L., 4,963,515, Cl. 501-84.000.

Durkee, John B.: *See*—
Adney, Billy R.; Alworth, Charles W.; Durkee, John B.; and Jeffries, Bryce T., 4,962,666, Cl. 73-223.000.

Duro-Last Roofing, Inc.: *See*—
Nichols, Wayne G.; Greko, John C.; and Laurion, Francis R., 4,963,219, Cl. 156-304.200.

Durr, Heinrich; and Adamek, Manfred, to U.S. Philips Corporation. Printer. 4,963,043, Cl. 400-196.000.

Dussart, Jena-Luc; David, Richard; and Grange, Bruno, to Picanol N.V. Pin type faulty weft extractor. 4,962,793, Cl. 139-116.200.

Dutzmann, Stefan: *See*—
Wollweber, Detlef; Brandes, Wilhelm; and Dutzmann, Stefan, 4,963,181, Cl. 71-95.000.

Dye, Wayne K., Jr.: *See*—
Fransen, Sig T.; and Dye, Wayne K., Jr., 4,962,716, Cl. 114-263.000.

Dymax Corporation: *See*—
Bachmann, Andrew G.; and Bickley, Robert F., 4,963,220, Cl. 156-307.300.

Dynamit Nobel Aktiengesellschaft: *See*—
Faber, Gunther; Florin, Hans; Grommes, Peter-Josef; and Roh, Peter, 4,963,204, Cl. 149-40.000.

Dynawave Incorporated: *See*—
Lewis, Christopher; Gartzke, Donald G.; and Scannelli, Anthony R., 4,963,105, Cl. 439-578.000.

E. R. Squibb & Sons, Inc.: *See*—
Delaney, Norma G., 4,963,539, Cl. 514-119.000.
Krapcho, John, 4,963,671, Cl. 540-491.000.
Steer, Peter L.; and Wiltshire, Neil P., 4,963,136, Cl. 604-339.000.

Earner, Margaret D. Portable swimming apparatus. 4,962,923, Cl. 272-71.000.

East, Anthony J.: *See*—
DeMartino, Ronald N.; East, Anthony J.; and Calundann, Gordon W., 4,963,633, Cl. 526-323.200.

Eastman Kodak Company: *See*—
Bryan, Philip S.; Lambert, Patrick M.; Towers, Christine M.; and Jarrold, Gregory S., 4,963,753, Cl. 250-483.100.
Bryan, Philip S.; Lambert, Patrick M.; Towers, Christine M.; and Jarrold, Gregory S., 4,963,754, Cl. 250-483.100.
Davis, Burns, deceased, 4,963,641, Cl. 528-190.000.
Detty, Michael R., 4,963,669, Cl. 540-1.000.
Honickman, Aline M.; Steeves, John L.; Higgins, Michael A.; and Frary, Anna M., 4,964,067, Cl. 364-520.000.
Morton, Roger A., 4,963,989, Cl. 358-298.000.
Resch, William A., III, 4,963,899, Cl. 346-157.000.
Shaw, James D.; and Muszak, Martin F., 4,963,333, Cl. 422-99.000.
Tamary, Ernest J., 4,963,943, Cl. 355-290.000.
Tortorici, Frank J.; Barton, Kenneth R.; and Queen, Lawrence D., 4,963,652, Cl. 524-604.000.
VanScooter, Paul E., 4,963,997, Cl. 358-493.000.
Wash, Michael L.; Silva, Fernando G.; and Quattrini, Thomas J., 4,964,139, Cl. 375-23.000.
Womack, Kenneth H., 4,963,984, Cl. 358-225.000.

Eaton Corporation: *See*—
Clancey, Stephen M., 4,962,838, Cl. 192-106.100.

Eaton, David F.: *See*—
Anderson, Albert G.; Eaton, David F.; Tam, Wilson; and Wang, Ying, 4,962,979, Cl. 350-1.100.

Eatz, Ralph A.: *See*—
Sinor, Lyle T.; Eatz, Ralph A.; Stone, Darryl L.; and Plapp, Fred V., 4,963,478, Cl. 435-7.000.

Eberle, Gunter, to Andreas Hettich, Firma. Protective device for capillary tubelets. 4,963,326, Cl. 422-101.000.

Ebetino, Frank H., to Norwich Eaton Pharmaceuticals, Inc. Process for synthesis of aminomethylene phosphonoalkylphosphinates. 4,963,681, Cl. 546-22.000.

Ecanow, Bernard, to Medaphore, Inc. Drug delivery compositions and methods. 4,963,367, Cl. 424-485.000.

Ecanow, Bernard, to Synthetic Blood Corporation. Oral insulin and a method of making the same. 4,963,526, Cl. 514-3.000.

ECC International Limited: *See*—
Jones, Thomas R.; and Gould, Caryl, 4,963,436, Cl. 428-403.000.

Eckenhoff, James B., to Alza Corporation. Dispensing system for administering beneficial agent formulation to ruminants. 4,963,141, Cl. 604-892.100.

Eckhardt, Helmut: *See*—
Shacklette, Lawrence W.; Jen, Kwan-Yue; Eckhardt, Helmut; Elsenbaumer, Ronald L.; and Baughman, Ray H., 4,963,206, Cl. 156-99.000.

Eclipse, Inc.: *See*—
Spielman, Lyle S., 4,963,089, Cl. 431-351.000.

Edo Corporation, Western Division: *See*—
Bromfield, George, 4,964,106, Cl. 367-165.000.

Eduard Kusters Maschinenfabrik GmbH & Co. KG: *See*—
Kubik, Klaus; and Kuesters, Karl-Heinz, 4,962,577, Cl. 29-116.200.

Edwards, Don: *See*—
Blackmon, James B.; and Edwards, Don, 4,963,025, Cl. 356-376.000.

Egashira, Noritaka; and Satake, Naoto, to Dai Nippon Insatsu Kabushiki Kaisha. Heat transfer sheet. 4,963,522, Cl. 503-227.000.

Egawa, Akira, to Fanuc Ltd. High-frequency discharge pumped laser device. 4,964,136, Cl. 372-61.000.

Eguchi, Yasuteru, to Kao Corporation. Toothbrush. 4,963,046, Cl. 401-160.000.

Ehrenfreund, Josef: *See*—
Boger, Manfred; Drabek, Jozef; Ehrenfreund, Josef; and Kristiansen, Odd, 4,963,550, Cl. 514-249.000.

Ehret, Charles: *See*—
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Ehrlich, Susan J.: *See*—
Stockton, Gerald W.; Chidester, Dale H.; and Ehrlich, Susan J., 4,963,499, Cl. 436-147.000.

Eisen, Ivan R.; and Morris, Ruth A., to International Business Machines Corporation. Method for automatically adjusting help information displayed in an online interactive system. 4,964,077, Cl. 364-900.000.

Eisenblaetter, Horst: *See*—
Beaujean, Hans-Josef; Eisenblaetter, Horst; Fues, Johann F.; Giesen, Brigitte; Holz, Erich; Jahnke, Ulrich; Kuenzel, Werner; Meffert, Alfred; Schwadtke, Karl; Smulders, Eduard; Sung, Eric; Syldatk, Andreas; Toelken, Hans-Georg; and Wegener, Ingo, 4,963,158, Cl. 8-137.000.

EJA Engineering Company Limited: *See*—
Mohtasham, Mehdi, 4,963,706, Cl. 200-334.000.

Ekin, John W.; Panson, Armand J.; and Blankenship, Betty A., to United States of America, Commerce; and Westinghouse Electric Corporation. High-T_c superconducting unit having low contact surface resistivity and method of making. 4,963,523, Cl. 505-1.000.

ELANTEC: *See*—
Gross, William H.; and Cecil, James B., 4,963,802, Cl. 318-294.000.

Electricite de France (Service National): *See—*
Gemma, Antoine, 4,962,566, Cl. 15-304.000.
El-Hindi, Lawrence: *See—*
Barcomb, Lyle B.; and El-Hindi, Lawrence, 4,963,259, Cl. 210-386.000.
Ellenbaum, Frank H.; and Ciesco, Richard, to Applied Industrial Materials Corporation. Agglomerates containing olivine for use in blast furnace. 4,963,185, Cl. 75-323.000.
Ellis, Ronald W.; Hagopian, Arpi; Kniskern, Peter J.; and Montgomery, Donna L., to Merck & Co., Inc. Method for producing hepatitis B virus proteins in yeast. 4,963,483, Cl. 435-69.300.
Ells, Delbert O.: *See—*
Bjerke, Robert K.; Ward, James P.; Ells, Delbert O.; and Kees, Kenneth P., 4,963,201, Cl. 149-2.000.
Elsenbaumer, Ronald L.: *See—*
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Ely, Joseph C., to International Business Machines Corporation. Self adjusting video interface. 4,964,069, Cl. 364-521.000.
Emerson Electric Co.: *See—*
Mak, Sioe T., 4,963,853, Cl. 340-310.00A.
EMS-Inventa AG: *See—*
Schmid, Eduard; and Luedi, Doris, 4,963,610, Cl. 524-436.000.
Endo, Noboru; Kozaki, Takahiko; Kuwahara, Hiroshi; Ohtsuki, Kenichi; and Gohara, Shinobu, to Hitachi, Ltd. Method and system for packet exchange. 4,964,119, Cl. 370-60.000.
Endress u. Hauser GmbH u. Co.: *See—*
Schneider, Georg; Freudig, Gunter; Rippinger, Fernand; and Braun, Hans, 4,963,872, Cl. 341-142.000.
Engdahl, Lawrence W.; and Stein, Howard E., to Stenmisk, Incorporated. Variable sunshield. 4,962,780, Cl. 135-20.00R.
Engler, Bernd; Koberstein, Edgar; and Lox, Egbert, to Degussa Aktiengesellschaft. Exhaust-gas catalyst with reduced tendency to store sulfur oxides and to emit hydrogen sulfide and process for preparing the catalyst. 4,963,521, Cl. 502-207.000.
Engler, Bernd: *See—*
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Englund, Richard L.; and Schwartz, Thomas W., to Minnesota Mining and Manufacturing Company. Compounding, glazing or polishing pad. 4,962,562, Cl. 15-230.160.
Eniricerche S.p.A.: *See—*
Roggero, Arnaldo; Pedretti, Ugo; Magagnini, Pier L.; Montani, Enrico; Hakemi, Hassan A.; Bresci, Bruno; and La Mantia, Francesco P., 4,963,642, Cl. 528-190.000.
Enokido, Yuji: *See—*
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Enright, Dorothy P.: *See—*
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Enstrom, Richard A.: *See—*
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Entravision, Inc.: *See—*
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Epstein, Joseph W.: *See—*
Tseng, Shin S.; Brabander, Herbert J.; Baker, Jannie S.; and Epstein, Joseph W., 4,963,552, Cl. 514-253.000.
Tseng, Shin S.; Brabander, Herbert J.; and Epstein, Joseph W., 4,963,553, Cl. 514-258.000.
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Tu, Chin-Yun J.; Clark, George W.; and Borsotti, Giampietro, 4,963,679, Cl. 544-357.000.
Erdman, John L., to Honeywell Inc. Safety-related parameter inputs for microprocessor ignition controller. 4,963,088, Cl. 431-2.000.
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Kloosterhouse, Donald H., 4,962,841, Cl. 198-372.000.
Esch, John W., to Unisys Corporation. System and method for frame and unit-like symbolic access to knowledge represented by conceptual structures. 4,964,063, Cl. 364-513.000.
Esposito, Michael A.: *See—*
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Estes, John W. Plural display casket. 4,962,574, Cl. 27-2.000.
Etat Francais represente par le Ministre des Postes et Telecommunications Centre National: *See—*
Thioulouse, Pascal; and Budin, Jean-Pierre, 4,963,861, Cl. 340-781.000.
Ethyl Corporation: *See—*
Schleifstein, Robert A., 4,963,606, Cl. 524-180.000.
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Eto, Yoshizumi: *See—*
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Etoh, Hideyuki; Shida, Kozo; Tange, Toshiyuki; and Shiotani, Yoshio, to Kawasaki Jukogyo Kabushiki Kaisha. Spot welder. 4,963,712, Cl. 219-86.900.
Etoh, Yohsiyuki: *See—*
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Roels, Timothy J.; and Affeldt, Jeannine L., 4,963,446, Cl. 429-94.000.
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Exxon Chemical Patents Inc.: *See—*
Gutierrez, Antonio; and Lundberg, Robert D., 4,963,275, Cl. 252-47.000.
Rosental, Celio; and Rossi, Albert, 4,963,279, Cl. 252-56.00R.
Exxon Production Research Company: *See—*
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Exxon Research & Engineering Company: *See—*
Anderson, Bryce P., 4,963,303, Cl. 264-41.000.
Baird, William C., Jr.; Riley, Kenneth L.; and Swan, George A., III, 4,963,249, Cl. 208-139.000.
Bock, Jan; and Valint, Paul L., 4,963,632, Cl. 526-240.000.
Faber, Gunther; Florin, Hans; Grommes, Peter-Josef; and Roh, Peter, to Dynamit Nobel Aktiengesellschaft. Pyrotechnic delay compositions. 4,963,204, Cl. 149-40.000.
Factory Mutual Research: *See—*
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Faidel, Garri I.: *See—*
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Fair, Barbara E.: *See—*
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Falk, R. Aaron, to Boeing Company, The. Parallel residue to mixed base converter. 4,963,869, Cl. 341-83.000.
Falotico, Robert: *See—*
Comba, Donald W.; Falotico, Robert; and Ritchie, David M., 4,963,554, Cl. 514-259.000.
Fan, Steve T.; and Koski, William E., to General Mills, Inc. R-T-E cereal composition and method of preparation. 4,963,373, Cl. 426-74.000.
Fang, Wei-Chou: *See—*
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Fanuc Ltd.: *See—*
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Yonekura, Mikio, 4,964,140, Cl. 375-36.000.
Fanuc Ltd: *See—*
Egawa, Akira, 4,964,136, Cl. 372-61.000.
Kokura, Masuo, 4,963,803, Cl. 318-569.000.
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Maresca, Louis M.; Farnham, Alford G.; Schwab, Thomas H.; and Steiner, Ulrich A., 4,963,643, Cl. 528-211.000.
Farrar, Luther L. Combination grilling and smoking cooker. 4,962,697, Cl. 99-340.000.
Farrington, Edward J.; and Van Keimpema, Gerrit J., to Koninklijke Emballage Industrie Van Leer B.V. Thermoplastic container having end wall butt-welded to body. 4,962,862, Cl. 220-613.000.
Fatool, Francis N.; and Fatool, Wade. Paint can holder. 4,962,906, Cl. 248-148.000.
Fatool, Wade: *See—*
Fatool, Francis N.; and Fatool, Wade, 4,962,906, Cl. 248-148.000.
Faure, Jean-Francois, to Pechiney Recherche Groupement d'Interet Economique. Process for the production of good fatigue strength aluminum alloy components. 4,963,322, Cl. 419-33.000.
Fava, Enzo: *See—*
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Fenoglio, David J.; Song, Yoon S.; and Basalay, Robert J., to Amoco Corporation. Increasing viscosity storage stability of Mannich base dispersant/VI-improvers. 4,963,277, Cl. 252-51.50A.
Fenoglio, David J.; Fjare, Douglas E.; and Melquist, John L., to Amoco Corporation. Polyamide, polyimide, and polyamide-imide polymers of diamino-t-butyltoluene. 4,963,648, Cl. 528-350.000.
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Ferguson, Stephen P.; and Berry, Allan D., to GEC-Plessey Telecommunications Limited. TDM data transmission system. 4,964,122, Cl. 370-102.000.
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Fluegel, Theodore D.; and Dishner, Bryan W., to Sundstrand Corporation. Integrated electrical conducting, cooling and clamping assembly for power semiconductors. 4,963,976, Cl. 357-82.000.
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Forrest, Kim K. Injectable local anesthetic antidote. 4,963,345, Cl. 424-10.000.
Forssen, Eric A., to Vestar, Inc. Phospholipid delivery vehicle for aqueous-insoluble active ingredients. 4,963,363, Cl. 424-450.000.
Fortes, Rudy F., to Boeing Company, The. Aircraft control surface linkage. 4,962,902, Cl. 244-75.00R.
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Foster, Dean H.; Wright, William J.; and Kish, Richard E., to Pitney Bowes Inc. Envelope opening apparatus. 4,962,624, Cl. 53-76.000.
Foster, John W.; and Fryda, Lawrence J., to Illinois State University. Groundwater azimuth detection. 4,963,019, Cl. 356-28.000.
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Foster, Raymond K. Reciprocating floor conveyor. 4,962,848, Cl. 198-750.000.
Fourman, Robert G.; Dixon, Richard P.; and Breuer, Hans, to Carter-Wallace Inc., a part interest. Cosmetic compositions. 4,963,591, Cl. 514-944.000.
Fournier, Thierry, to Societe Anonyme dite: Alsthom Fluides. Sluice gate for automatically regulating a level. 4,963,057, Cl. 405-93.000.
Fourquier, Dominique; and Perronin, Jean, to Societe Chimique des Charbonnages S.A. Low temperature self-crosslinkable polymer compositions and processes. 4,963,617, Cl. 524-805.000.
Fox, Sidney W.; and Veltri, Robert W. Microencapsulated antitumor agent. 4,963,364, Cl. 424-455.000.
Franceschini, Michael R., to Hazeltine Corporation. Method and apparatus for enhancing the signal resolution of an analog-to-digital converter. 4,963,881, Cl. 341-131.000.
Francioni, Renzo, to Cavanna S.p.A. Method for regulating the advance of products in automatic packaging equipment, and equipment operating according to the method. 4,962,844, Cl. 198-460.000.
Francisco, Robert, to Pitney Bowes Inc. Asynchronous rejection in an inserter. 4,962,623, Cl. 53-54.000.
Fransen, Sig T.; and Dye, Wayne K., Jr., to Oregon Marine Floats, Inc. Floating dock having shock-absorbing coupling. 4,962,716, Cl. 114-263.000.
Frantzos, Dimitri; and Hamel, Pierre. Material stress monitor. 4,962,668, Cl. 73-784.000.
Franzmann, Karl W., to Burroughs Wellcome Co. Nitrogen containing heterocyclic compounds. 4,963,562, Cl. 514-307.000.
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Fujimura, Takeo, to Mitsubishi Denki Kabushiki Kaisha. Correction lens system used in production of fluorescent screen of color picture tube and method of manufacturing correction lens system. 4,963,008, Cl. 350-452.000.
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Gibbs, Joyce K. Anti-theft device for automotive audio equipment. 4,962,651, Cl. 70-58.000.
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Goela, Jitendra S.; Jaworski, Roy D.; and Taylor, Raymond L., to CVD Incorporated. Method to prevent backside growth on substrates in a vapor deposition system. 4,963,393, Cl. 427-248.100.
Goesele, Ulrich M.; and Lehmann, Volker, to Duke University. Method for bubble-free bonding of silicon wafers. 4,962,879, Cl. 228-116.000.
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Gohlisch, Hans-Joachim; and Klein, Heinz, to Paul Troester Maschinenfabrik. Process and apparatus for processing elastomeric materials in particular plastic, rubber and a mixture thereof. 4,963,309, Cl. 264-175.000.
Gold, Peter N. Drainage guide for automobile window. 4,962,601, Cl. 49-374.000.
Golden, Theodore A. Thermal bandage. 4,962,761, Cl. 128-400.000.
Goldovsky, Viktor L.; Stetsovich, Viktor I.; and Zayats, Andrei J. Correlational gas analyzer. 4,963,023, Cl. 356-308.000.
Goldstein, Joel M.; and O'Malley, Thomas M., to Aquarium Pharmaceuticals, Inc. Zeolite-impregnated pads. 4,963,431, Cl. 428-288.000.
Goldstein, Samuel A.; and Alonso, Jose A. P. Liquid shaving product. 4,963,350, Cl. 424-73.000.
Gooding, Chester W., Jr.; and Mead, Maurice J., to James River Corporation of Virginia. Absorbent paper towel or tissue product. 4,963,406, Cl. 428-43.000.
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Goto, Kazumasa; Shin, Hiroto; Ishida, Hideki; Goto, Yasuo; and Iwahashi, Akira, to Inax Corporation. Sintered ceramic body with excellent refractories (heat resistance) and machinability and method of manufacture of the same. 4,963,517, Cl. 501-122.000.
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Gottschling, Wolfgang; Guenther, Klaus; Kloss, Hans-Georg; Radtke, Rainer; and Serick, Felix, to Kombinat VEB Narva. High-pressure sodium vapor lamp. 4,963,796, Cl. 315-246.000.
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Graton, Michel, to Valeo. Torsion damping device including viscous damping means, in particular for automotive vehicles. 4,963,119, Cl. 464-24.000.
Graver, James H. Grill exhaust system. 4,962,694, Cl. 99-339.000.
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Gross, William H.; and Cecil, James B., to ELANTEC. Resistor programmable velocity controller. 4,963,802, Cl. 318-294.000.
Grossman, Mark W., to GTE Products Corporation. Electroded photochemical lamps for photochemical mercury separation. 4,963,783, Cl. 313-22.000.
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Andrews, Leonard J.; and Miniscalco, William J., 4,962,995, Cl. 350-96.340.
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Blair, Kevin B., 4,964,156, Cl. 379-189.000.
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Brown, David R.; Frost, Charles E., Jr.; and White, Kenneth A., 4,963,178, Cl. 65-144.000.
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Ellis, Ronald W.; Hagopian, Arpi; Kniskern, Peter J.; and Montgomery, Donna L., 4,963,483, Cl. 435-69.300.

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Halvorsen, Robert M., to Fuel Systems Textron Inc. Airblast fuel injection with adjustable valve cracking pressure. 4,962,889, Cl. 239-410.000.

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Hamada, Shoichi: *See*—
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Hamilton, Jonathan W. Scraping device. 4,962,561, Cl. 15-111.000.

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Wilkins, Charles H. T.; Hammack, Jack; and Thompson, Charles B., 4,963,280, Cl. 252-58.000.

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Hara, Toshiro: *See*—
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Chapin, J. Thomas; Hardee, Addison G., Jr.; Larseon-Moss, Lisa M.; Leshe, Charles M.; Overton, Bob J.; Shea, John W.; Taylor, Carl R.; and Turnipseed, John M., 4,962,992, Cl. 350-96.230.

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Harney, Michael; Doremus, Mark; Nussrallah, Steve; Lowcock, Roy; and West, Lamar, Jr., to Scientific Atlanta, Inc. CATV distribution system, especially adapted for off-premises premium channel interdiction. 4,963,966, Cl. 358-349.000.

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Harrell, William S., Jr. Device for cleaning surfaces submerged in a fluid. 4,962,558, Cl. 15-1.700.

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Harris, Gary S., to DSP, Inc. Quick connect-disconnect coupling for snow plow. 4,962,599, Cl. 37-266.000.

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Haskell, Jacob D., to Advanced Micro Devices, Inc. EPROM element employing self-aligning process. 4,964,143, Cl. 357-23.500.

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Hasty, Charles E. Air-operated body support device. 4,962,552, Cl. 5-453.000.

Hata, Yoshiaki: *See*—
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Hayashi, Isao. Frames for constructing pavement boards. 4,963,054, Cl. 404-34.000.

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Franceschini, Michael R., 4,963,881, Cl. 341-131.000.

Heart Tech of Minnesota, Inc.: *See*—
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Heath, William D., Jr.: *See*—
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Kipphan, Helmut, 4,963,029, Cl. 356-401.000.

Heijnemans, Werner A. L.; and Bouwhuis, Gijsbertus, to U.S. Philips Corporation. Compact rear-projection system with obliquely incident light beam. 4,963,016, Cl. 353-74.000.

Heindl, Friedrich; Schnuecker, Franz; and Huber, Anton, to Battenfeld Automatisierungstechnik GmbH. Method and apparatus for quality control of molded articles manufactured by injection molding machines or die casting machines. 4,963,302, Cl. 264-40.400.

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Carter, William A., 4,963,532, Cl. 514-44.000.

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Benedikt, Walter; Friese, Karl-Hermann; Herden, Werner; Schuldt, Dietrich; and Steinke, Leo, 4,963,112, Cl. 445-7.000.

Herdewijn, Piet A. M. M.: *See*—
de Clercq, Erik D. A.; Herdewijn, Piet A. M. M.; Broder, Samuel; and Balzarini, Jan M. R., 4,963,533, Cl. 514-49.000.

Heritage, John R.: *See*—
Sanderson, Michael L.; and Heritage, John R., 4,962,670, Cl. 73-861.190.

Herrmann, Heinz: *See*—
Bokareva, Elvina Z.; Schinkorenko, Jelena V.; Terenko, Viktor V.; Nosova, Larisa A.; Faidel, Garri I.; Nurmuchomedov, Sijar N.; Beljakov, Anatolij V.; Vlasov, Ivan M.; Fuerst, Anton; Herrmann, Heinz; Pantzer, Eckart; Stoehrer, Bernhard; Uhland, Eberhard; and Werner, Hans, 4,963,650, Cl. 528-481.000.

Hervas, Pedro L. Hydraulic device with flexible body for surgical anastomosts. 4,962,877, Cl. 227-179.000.

Herzon, Garrett D. Nerve locator and stimulator. 4,962,766, Cl. 128-741.000.

Hewlett-Packard Company: *See*—
Baldwin, Richard R., 4,962,997, Cl. 350-172.000.
Berger, Terry A., 4,962,662, Cl. 73-23.420.
Brownlee, Kenneth G., 4,963,933, Cl. 355-218.000.
Hickman, Mark S., 4,963,882, Cl. 346-1.100.
Hindagolla, Suraj L., 4,963,189, Cl. 106-22.000.
Quan, Ronald; and Bayley, Brian J., 4,963,756, Cl. 250-568.000.
Quan, Ronald, 4,963,764, Cl. 307-270.000.
Smith, George E., 4,964,025, Cl. 362-346.000.

Heyden, Eugene L. Device for urine drainage. 4,963,137, Cl. 604-349.000.

Heyneker, Herbert L.: *See*—
Chang, Chung N.; Gray, Gregory L.; Heyneker, Herbert L.; and Rey, Michael W., 4,963,495, Cl. 435-320.000.

Hi-Tek Polymers, Inc.: *See*—
Patel, Hirendra K., 4,963,602, Cl. 523-403.000.

Hibbert, Gordon E.: *See*—
Clarke, Graham J.; Hibbert, Gordon E.; Jensen, Helge; and Clabburn, Robin J. T., 4,963,819, Cl. 324-126.000.

Hibino, Ken; Okada, Takeshi; Nakao, Kazuo; and Sahashi, Yuko, to Nitto Electric Industrial Co., Ltd. Enzyme immobilization in an anisotropic ultrafiltration membrane. 4,963,494, Cl. 435-288.000.

Hickman, Mark S., to Hewlett-Packard Company. Printing of pixel locations by an ink jet printer using multiple nozzles for each pixel or pixel row. 4,963,882, Cl. 346-1.100.

Hicks, John R.; and Mailandt, Peter, to Decibel Products, Inc. Computer-controlled electronic system monitor. 4,964,065, Cl. 364-514.000.

Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo ; Soos, Ruldof; Radvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Pyrethroidal composition comprising more than one active ingredients. 4,963,584, Cl. 514-521.000.

Hieda, Teruo, to Canon Kabushiki Kaisha. Image pickup apparatus with excess-charge control. 4,963,982, Cl. 358-213.180.

Hieda, Teruo: *See*—
Ueda, Osamu; and Hieda, Teruo, 4,963,978, Cl. 358-29.000.

Higashiguchi, Teruaki: *See*—
Yano, Koji; Miyakawa, Nobuhiro; Higashiguchi, Teruaki; Yamamoto, Kazuo; and Kawakami, Yoshinobu, 4,963,454, Cl. 430-106.600.

Higashihara, Masaki: *See*—
Suda, Yasuo; and Higashihara, Masaki, 4,963,912, Cl. 354-404.000.

Higashimori, Shosuke: *See*—
Kawase, Mitsuru; Tanimura, Masashi; Terasawa, Hidekazu; Nakamura, Sohei; Nagano, Takayuki; Higashimori, Shosuke; Matsuki, Hiroshi; and Matsumoto, Hisashi, 4,963,230, Cl. 162-129.000.

Higgins, George L., to Brent Chemicals International plc. Composition and process for treating metal surfaces. 4,963,198, Cl. 148-267.000.

Higgins, Michael A.: *See*—
Honickman, Aline M.; Steeves, John L.; Higgins, Michael A.; and Frary, Anna M., 4,964,067, Cl. 364-520.000.

Highfill, Louis A., to Monsanto Company. Use of potassium kurrol's salt to preserve live fish. 4,962,728, Cl. 119-3.000.

Higuchi, Yukio: *See*—
Hirano, Akira; Watanabe, Shinichi; Fukuda, Yutaka; Higuchi, Yukio; Shibano, Fumio; Sekino, Hiroshi; Nabeshima, Hiroichi; and Nishizawa, Yukimasa, 4,962,664, Cl. 73-118.100.

Hiiro, Hiroyuki, to Fuji Photo Film Co., Ltd. Laser optical system. 4,963,003, Cl. 350-403.000.

Hikuma, Hideo: *See*—
Konishi, Yoshihiro; Konno, Kenichi; Awai, Ikuo; and Hikuma, Hideo, 4,963,844, Cl. 333-208.000.

Hildebrandt, Bodo, to Wella Aktiengesellschaft. Arrangement for treating hair with liquid in circulating process. 4,962,788, Cl. 137-557.000.

Hildebrandt, Bodo, to Wella Aktiengesellschaft. Multi-compartment container for pourable substances. 4,962,853, Cl. 206-222.000.

Hilfenhaus, Joachim: *See*—
Schorlemmer, Hans U.; Sedlacek, Hans H.; and Hilfenhaus, Joachim, 4,963,577, Cl. 514-369.000.

Hill, Kenneth O.: *See*—
Najafi, Seyed-Iraj; Hill, Kenneth O.; Bilodeau, Francois; and Johnson, Derwyn C., 4,963,177, Cl. 65-30.130.

Hillen, Wolfgang: *See*—
Gatz, Christiane; Altschmied, Joachim; Gassen, Hans G.; and Hillen, Wolfgang, 4,963,488, Cl. 435-233.000.

Hillman, Robert S.; Cobb, Michael E.; Allen, Jimmy D.; Gibbons, Ian; Ostoich, Vladimir E.; and Winfrey, Laura J., to Biotrack. Capillary flow device. 4,963,498, Cl. 436-69.000.

Hilton, Robert M.: *See*—
Ahern, Brian S.; and Hilton, Robert M., 4,963,334, Cl. 422-249.000.

Hiltpold, W. Randolph; and Gowni, Shiva P., to Cypress Semiconductor. Circuit for selective power-down of unused circuitry. 4,963,769, Cl. 307-465.000.

Himura, Masato; and Suzuki, Hiroshi, to Nittan Valve Co., Ltd. Liquid pressure tensioner. 4,963,121, Cl. 474-110.000.

Hindagolla, Suraj L., to Hewlett-Packard Company. Waterfast ink formulations with a novel series of anionic dyes containing two or more carboxyl groups. 4,963,189, Cl. 106-22.000.

Hines, Marshall U.: *See*—
Ball, Larry K.; and Hines, Marshall U., 4,962,783, Cl. 137-1.000.

Hinkle, John H. Stone slotting machine. 4,962,967, Cl. 299-41.000.

Hinley, John J., to Tioxide Group PLC. Tanning agent and process. 4,963,156, Cl. 8-94.290.

Hinnenkamp, James A.: *See*—
Landau, Steven D.; and Hinnenkamp, James A., 4,963,518, Cl. 502-62.000.

Hino, Hirokazu: *See*—
Yamauchi, Yasuhiro; Arakawa, Yoshihisa; Fujima, Yukihisa; Takenaga, Kiyomasa; and Hino, Hirokazu, 4,962,711, Cl. 110-347.000.

Hintz, Gerhart: *See*—
Gernhart, Peter; Hintz, Gerhart; Keller, Guenter; Treusch, Werner; and Zoeller, Karl, 4,962,669, Cl. 73-800.000.

Hirai, Tokuyuki: *See*—
Suzuki, Hitoshi; Shiotani, Shinobu; Tokunaga, Shinji; Hirai, Tokuyuki; Fukumochi, Yoji; Kugimiya, Shuzo; and Sata, Ichiko, 4,964,030, Cl. 364-419.000.

Hiraishi, Atsushi: *See*—
Watanabe, Atsuo; Yazawa, Yoshiaki; Hiraishi, Atsushi; Minami, Masataka; Nagano, Takahiro; Ikeda, Takahide; and Momma, Naohiro, 4,963,973, Cl. 357-42.000.

Hiraishi, Shigetoshi: *See*—
Matsushita, Toshihiko; Hiraishi, Shigetoshi; and Morishita, Sadao, 4,963,457, Cl. 430-138.000.

Hirano, Akira; Watanabe, Shinichi; Fukuda, Yutaka; Higuchi, Yukio; Shibano, Fumio; Sekino, Hiroshi; Nabeshima, Hiroichi; and Nishizawa, Yukimasa, to Honda Giken Kogyo Kabushiki Kaisha; and Anzen Motor Car Co., Ltd. Roller clamp type wheel examining apparatus. 4,962,664, Cl. 73-118.100.

Hirano, Sadayuki: *See*—
Murano, Katsuaki; Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 4,962,678, Cl. 74-844.000.

Hirano, Susumu: *See*—
Okuda, Takanari; Nomura, Shigeo; Shibahara, Itaru; Enokido, Yuji; Fujiwara, Masayuki; Nishida, Toshio; Teranishi, Hiroshi; Hirano, Susumu; Iseda, Aturou; and Nakajima, Motoharu, 4,963,200, Cl. 148-325.000.

Hirano, Tetsuji: *See*—
Inoue, Hiroshi; Muramatsu, Tadao; and Hirano, Tetsuji, 4,963,645, Cl. 528-342.000.

Hiranuma, Haruki; and Matsumoto, Nobuhide, to Seiko Instruments Inc. Opening and closing structure of cover lid of watch. 4,964,093, Cl. 368-283.000.

Hirashima, Hidenori: *See*—
Katayama, Sakae; Ito, Yosuke; and Hirashima, Hidenori, 4,963,586, Cl. 514-547.000.

Hirata, Keiichi: *See*—
Kawakami, Yasushi; Hirata, Keiichi; Kamisaka, Mizuho; Mukai, Miyako; Ban, Tomohiro; and Ooishi, Minoru, 4,963,042, Cl. 400-17.000.

Hirata, Makizo: *See*—
Braun, Stephen A.; O'Neill, Michael J.; Curry, Roger W.; Titze, James R.; Niosi, Donald E.; Fujikawa, Tetsuzo; Hirata, Makizo; and Nishimura, Michio, 4,962,631, Cl. 56-17.200.

Hirayama, Hiromichi; Mihara, Masato; and Harumatsu, Mitsuo, to Victor Company of Japan, Ltd. Magnetic recording/reproducing apparatus for selective use with tape cassettes of two different sizes. 4,964,001, Cl. 360-94.000.

Hirayama, Nobuhiro: *See*—
Shin, Masaaki; Hirayama, Nobuhiro; Ishikawa, Keiichi; and Misawa, Akira, 4,963,456, Cl. 430-109.000.

Hirose, Toshifumi; and Isayama, Katsuhiko, to Kanegafuchi Chemical Industry Co. Ltd. Curable polymer composition. 4,963,626, Cl. 525-403.000.

Hirotec Corporation: *See*—
Otsuki, Noboru; Oonishi, Toshihiko; Tomioka, Katsumi; and Miura, Kozo, 4,962,881, Cl. 251-149.700.

Hirshberg, Alan J.: *See*—
Moyer, Mark C.; Day, James B.; and Hirshberg, Alan J., 4,962,579, Cl. 29-407.000.

Hishinuma, Kazuhiro, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 4,963,739, Cl. 250-327.200.

Hitachi Cable, Ltd.: *See*—
Hara, Shigeo; Sekine, Setsuo; Suzuki, Toshio; Taguchi, Minoru; Mitsuoka, Akio; and Tetsu, Yoshiyuki, 4,963,435, Cl. 428-379.000.

Hitachi Computer Engineering Co., Ltd.: *See*—
Aoyama, Tomoo; and Murayama, Hiroshi, 4,964,035, Cl. 364-200.000.

Hitachi Computer Peripherals Co., Ltd.: *See*—
Hara, Shigeo; Sekine, Setsuo; Suzuki, Toshio; Taguchi, Minoru; Mitsuoka, Akio; and Tetsu, Yoshiyuki, 4,963,435, Cl. 428-379.000.

Hitachi, Ltd.: *See*—
Aoyama, Tomoo; and Murayama, Hiroshi, 4,964,035, Cl. 364-200.000.
Bekki, Keisuke; Yokota, Takayoshi; Nagai, Tooru; and Hamada, Nobuhiro, 4,964,056, Cl. 364-488.000.
Doi, Nobukazu; Eto, Yoshizumi; Izumita, Morishi; Mita, Seiichi; and Takeshita, Kazuyuki, 4,963,992, Cl. 358-335.000.
Endo, Noboru; Kozaki, Takahiko; Kuwahara, Hiroshi; Ohtsuki, Kenichi; and Gohara, Shinobu, 4,964,119, Cl. 370-60.000.
Fujiwara, Mitsuru; Suzuki, Akira; and Uchida, Riichi, 4,963,079, Cl. 418-83.000.
Hara, Shigeo; Sekine, Setsuo; Suzuki, Toshio; Taguchi, Minoru; Mitsuoka, Akio; and Tetsu, Yoshiyuki, 4,963,435, Cl. 428-379.000.
Iwanaga, Shoichi; Fujiwara, Akio; Sowa, Takayoshi; and Yokono, Hitoshi, 4,963,512, Cl. 437-192.000.
Kawame, Keisuke; Asano, Toshio; and Mochizuki, Jun, 4,963,828, Cl. 324-404.000.
Kuniyoshi, Shinji; and Kumura, Takeshi, 4,964,146, Cl. 378-35.000.
Ogawa, Toshio; Katakura, Kageyoshi; Kondo, Shin-ich; Umemura, Shin'ichiro; Ikeda, Hiroshi; Ichikawa, Noriyoshi; and Kuriyama, Kinji, 4,962,667, Cl. 73-626.000.
Okamoto, Yukio; Komoda, Tsutomu; Shimura, Satoshi; Murayama, Seiichi; and Koga, Masataka, 4,963,735, Cl. 250-288.000.
Sato, Katsuyuki; and Yanagisawa, Kazumasa, 4,964,082, Cl. 365-189.090.
Sato, Shinichi; Sano, Koichi; Yokoyama, Tetsuo; and Koizumi, Hideki, 4,962,763, Cl. 128-653.00A.
Sekozawa, Teruji; Shioya, Makoto; Funabashi, Motohisa; and Onari, Mikihiko, 4,964,051, Cl. 364-431.040.
Shimamura, Hideaki; Sakata, Masao; Kobayashi, Shigeru; Yoneoka, Yuji; Kamei, Tsuneaki; Kawahito, Tsuneyoshi; Fujita, Shoyo; and Nakamura, Hiroshi, 4,963,239, Cl. 204-192.120.
Todaka, Yoshihiro; Imaide, Takuya; Kinugasa, Toshiro; and Noda, Masaru, 4,963,981, Cl. 358-213.130.
Ushio, Jiro; Miyazawa, Osamu; Tomizawa, Akira; Yokono, Hitoshi; Kanda, Naoya; Matsuura, Naoko; Ando, Setsuo; and Okudaira, Hiroaki, 4,963,974, Cl. 357-80.000.

Watanabe, Atsuo; Yazawa, Yoshiaki; Hiraishi, Atsushi; Minami, Masataka; Nagano, Takahiro; Ikeda, Takahide; and Momma, Naohiro, 4,963,973, Cl. 357-42.000.

Hitachi Medical Corporation: *See—*
Ogawa, Toshio; Katakura, Kageyoshi; Kondo, Shin-ich; Umemura, Shin'ichiro; Ikeda, Hiroshi; Ichikawa, Noriyoshi; and Kuriyama, Kinji, 4,962,667, Cl. 73-626.000.

Hitt, David H.: *See—*
Cook, Alexander; Rice, John N.; and Hitt, David H., 4,964,027, Cl. 361-40.000.

Hittite Microwave Corporation: *See—*
Ayasli, Yalcin, 4,963,773, Cl. 307-511.000.

Hiyama, Nobuo, to Izumo Industrial Co., Ltd. Rotary cutting tool. 4,963,059, Cl. 407-60.000.

Ho, Phillman N.: *See—*
Coyle, Roy T.; and Ho, Phillman N., 4,963,286, Cl. 252-183.140.

Hochstrasser, Ferdinand F., to KWC AG. Water driven generator for sanitary domestic installation. 4,963,780, Cl. 310-104.000.

Hocker, Eitel-Friedrich: *See—*
Habicht, Siegfried; Reppert, Rainer; and Hocker, Eitel-Friedrich, 4,962,710, Cl. 109-79.000.

Hoda, Takeo: *See—*
Inoue, Manabu; Taniguchi, Nobuyuki; Hata, Yoshiaki; Hoda, Takeo; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,963,907, Cl. 354-222.000.
Taniguchi, Nobuyuki; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; Hoda, Takeo; and Ueda, Hiroshi, 4,963,917, Cl. 354-484.000.

Hoechst Aktiengesellschaft: *See—*
Dessauer, Guido, 4,963,192, Cl. 106-499.000.
Keller, Reinhold; Holla, Wolfgang; and Fulling, Gerd, 4,963,492, Cl. 435-280.000.
Mrotzeck, Uwe; Mischke, Peter; Schwaiger, Gunther; Russ, Werner; and Sittig, Manfred, 4,963,660, Cl. 534-618.000.
Muth, Gunter; Wohlleben, Wolfgang; Puhler, Alfred; Wohner, Gerhard; and Marquardt, Rudiger, 4,963,496, Cl. 435-320.000.
Schlosser, Hans-Joachim; and Strack, Joerg, 4,963,472, Cl. 430-303.000.
Tappe, Horst; Oehme, Dieter; Schlafer, Ludwig; and Russ, Werner H., 4,963,661, Cl. 534-642.000.
Willms, Lothar; Kehne, Heinz; Bauer, Klaus; and Bieringer, Hermann, 4,963,180, Cl. 71-92.000.

Hoechst Celanese Corporation: *See—*
Chavez, Rodrigo G.; David, Harold; Metzner, Ernest K.; Sigler, Gerald F.; and Winn-Deen, Emily S., 4,963,479, Cl. 435-22.000.
Chen, Paul N., Sr.; Harget, Paul J.; and Dolce, Thomas J., 4,963,434, Cl. 428-378.000.
Chen, Paul N., Sr.; Chung, Tai-Shung; and Harget, Paul J., 4,963,628, Cl. 525-425.000.
DeMartino, Ronald N.; East, Anthony J.; and Calundann, Gordon W., 4,963,633, Cl. 526-323.200.
Vora, Rohitkumar H.; and Devolve, Jeffrey S., 4,963,647, Cl. 528-350.000.
Wilczak, Wojciech A., 4,963,462, Cl. 430-143.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See—*
Kosley, Raymond W., Jr.; and Cherill, Robert J., 4,963,537, Cl. 514-96.000.
Martin, Lawrence L.; and Allen, Richard C., 4,963,685, Cl. 546-146.000.

Hoetzl, Max; Brandewie, James A.; and Lingle, Thomas M., to Surface Combustion, Inc. Method and apparatus for effecting convective heat transfer in a cylindrical, industrial heat treat furnace. 4,963,091, Cl. 432-176.000.

Hof, Albrecht; Ulrich, Wilhelm; Rubl, Lothar; and Koch, Klaus-Peter, to Carl-Zeiss-Stiftung. Coordinate measuring apparatus having an optical sensing head. 4,963,728, Cl. 250-227.110.

Hoffken, Erich, to Thyssen Stahl Aktiegesellschaft. Method of producing a steel strip having a thickness of less than 10 mm. 4,962,808, Cl. 164-476.000.

Hoffman, Victor L.: *See—*
Woolhiser, Harold G.; and Hoffman, Victor L., 4,962,598, Cl. 37-231.000.

Hofman, Kurt A.: *See—*
Roth, Dietrich K.; and Hofman, Kurt A., 4,963,830, Cl. 324-715.000.

Hofmann, Aaron A.; and Skraba, Joseph S., to Intermedics Orthopedics, Inc. Asymmetric prosthetic tibial component. 4,963,152, Cl. 623-18.000.

Hofmann, Ruediger, to Siemens Aktiengesellschaft. Broadband signal switching equipment. 4,963,863, Cl. 340-825.880.

Hofstetter, Klaus: *See—*
Stahlecker, Gerd; and Hofstetter, Klaus, 4,962,633, Cl. 57-105.000.

Holck, Jens-Peter; Mertens, Alfred; Kampe, Wolfgang; Muller-Beckmann, Bernd; Sponer, Gisbert; and Strein, Klaus, to Boehringer Mannheim GmbH. Certain pyridinoylamino-indolin-2-one derivatives. 4,963,686, Cl. 546-273.000.

Holla, Wolfgang: *See—*
Keller, Reinhold; Holla, Wolfgang; and Fulling, Gerd, 4,963,492, Cl. 435-280.000.

Hollingsworth (U.K.) Ltd.: *See—*
Lane, Robert, 4,962,638, Cl. 57-301.000.

Holmquist, Marlon E., to T. O. Plastics, Inc. System for loading thin-walled plastic flower pots onto a loading tray. 4,962,855, Cl. 206-423.000.

Holt, Steven T.: *See—*
Wendt, Robert O.; Holt, Steven T.; and Schneider, Gordon L., 4,963,050, Cl. 403-197.000.

Holtermann, Dennis L.: *See—*
Zones, Stacey I.; Holtermann, Dennis L.; Santilli, Donald S.; Jossens, Lawrence W.; Kennedy, James V.; and Rainis, Andrew, 4,963,337, Cl. 423-277.000.

Holz, Erich: *See—*
Beaujean, Hans-Josef; Eisenblaetter, Horst; Fues, Johann F.; Giesen, Brigitte; Holz, Erich; Jahnke, Ulrich; Kuenzel, Werner; Meffert, Alfred; Schwadtke, Karl; Smulders, Eduard; Sung, Eric; Syldatk, Andreas; Toelken, Hans-Georg; and Wegener, Ingo, 4,963,158, Cl. 8-137.000.

Homma, Katsuhisa; Nikaido, Masaru; Ouchi, Yoshiaki; Yamazaki, Mutsuki; and Yoshizawa, Shuji, to Kabushiki Kaisha Toshiba. Heat-resistant insulating substrate, thermal printing head, and thermographic apparatus. 4,963,893, Cl. 346-76.0PH.

Hompel, M. ten; G[illegible]ser, Christoph; and Scherer, Roland, to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung e.V. Device for coupling light to and from a light guide. 4,962,986, Cl. 350-96.150.

Honda Giken Kigyo Kabushiki Kaisha: *See—*
Yagi, Toru; and Matsuki, Hideo, 4,962,672, Cl. 73-862.360.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Hirano, Akira; Watanabe, Shinichi; Fukuda, Yutaka; Higuchi, Yukio; Shibano, Fumio; Sekino, Hiroshi; Nabeshima, Hiroichi; and Nishizawa, Yukimasa, 4,962,664, Cl. 73-118.100.
Ichikawa, Akira; Iihoshi, Akira; Nakamura, Yukinobu; and Yasui, Shinichiro, 4,963,865, Cl. 340-995.000.
Iihoshi, Akira; Nakamura, Yukinobu; Matsumoto, Yoshiyuki; and Nishio, Tomoyuki, 4,963,864, Cl. 340-995.000.
Inoue, Kazuo; Katoh, Masaaki; and Kishi, Noriyuki, 4,962,732, Cl. 123-90.160.
Ishikawa, Yoshikazu; Yamaguchi, Kouji; and Sasajima, Koji, 4,962,679, Cl. 74-866.000.
Nakajima, Toyohei; Mieno, Toshiyuki; Toyoda, Yasuhiro; and Horiuchi, Haruo, 4,963,246, Cl. 204-406.000.
Yakuwa, Masahiko; Tomozawa, Kikuo; and Kishi, Kazuya, 4,964,050, Cl. 364-431.040.

Honda, Satoshi: *See—*
Kano, Akiko; Tsuchino, Hisanori; Nakano, Kuniaki; Shimada, Fumio; and Honda, Satoshi, 4,963,751, Cl. 250-484.100.

Honeywell Inc.: *See—*
Erdman, John L., 4,963,088, Cl. 431-2.000.
Jenekhe, Samson A., 4,963,616, Cl. 524-600.000.
Landis, William R.; and Bradford, Peter, 4,963,752, Cl. 250-459.100.
Mostashari, Scott S., 4,964,120, Cl. 370-016.000.
Williams, Paul F., 4,964,033, Cl. 364-200.000.

Hong, John H.; and Yeh, Pochi A., to Rockwell International Corporation. Adaptive optical neural network. 4,963,725, Cl. 250-201.900.

Hong, Joonypyo, to GTE Valenite Corporation. Corrosion resistant cemented carbide. 4,963,183, Cl. 75-241.000.

Honickman, Aline M.; Steeves, John L.; Higgins, Michael A.; and Frary, Anna M., to Eastman Kodak Company. Computer output printer with plotter emulation. 4,964,067, Cl. 364-520.000.

Honjo, Masahiro, to Matsushita Electric Industrial Co., Ltd. Video tape recorder capable of recording both narrow band and wideband signals. 4,963,991, Cl. 358-310.000.

Honkanen, Erkki J.: *See—*
Backstrom, Reijo J.; Heinola, Kalevi E.; Honkanen, Erkki J.; Kaakkola, Seppo K.; Kairisalo, Pekka J.; Linden, Inge-Britt Y.; Mannisto, Pekka T.; Nissinen, Erkki A. O.; Pohto, Pentti; Pippuri, Aino K.; and Pystynen, Jarmo J., 4,963,590, Cl. 514-678.000.
Sellin, Lawrence; Backstrom, Reijo J.; Heinola, Kalevi E.; Hoekanen, Erkki J.; Langenskiold, Tord K. W.; Ojala, Irma O.; Pippuri, Aino K.; and Pystynen, Jarmo J., 4,963,677, Cl. 544-247.000.

Honna, Kosaku; and Seiki, Hiromichi, to Idemitsu Kosan Company, Limited. Higher carboxylic acid triester of adamantane triol and lubricating oil containing the same. 4,963,292, Cl. 252-56.00S.

Hoots, John E.; Fivizzani, Kenneth P.; and Fair, Barbara E., to Nalco Chemical Company. Stabilization of manganese in aqueous systems. 4,963,267, Cl. 210-701.000.

Hordubay, Thomas D.: *See—*
Alexion, Christopher C.; Hordubay, Thomas D.; Mamrose, Wesley; Walk, Steven R.; and Slepian, Robert M., 4,963,694, Cl. 174-15.600.

Hori, Roy Y.: *See—*
Lazzeri, Mark A.; Hori, Roy Y.; and Harris, James C., 4,963,155, Cl. 623-23.000.

Hori, Ryuichi: *See—*
Shimizu, Masataka; Hori, Ryuichi; Kimura, Yoshio; Noma, Fumio; Isobe, Mitsutoshi; Kamijo, Tsunao; and Inaba, Shinichi, 4,963,186, Cl. 75-378.000.

Horimai, Hideyoshi; and Ogawa, Hiroshi, to Sony Corporation. Apparatus for reproducing a magneto-optical disk using a shot noise reduction circuit. 4,964,110, Cl. 369-110.000.

Horiuchi, Haruo: *See—*
Nakajima, Toyohei; Mieno, Toshiyuki; Toyoda, Yasuhiro; and Horiuchi, Haruo, 4,963,246, Cl. 204-406.000.

Horiuchi, Michio; and Machii, Tsuyoshi, to Shinko Electric Industries Co., Ltd. Ceramic mullite-silica glass composite. 4,963,514, Cl. 501-32.000.

Horiuchi, Takao; Arai, Izumi; and Tahara, Yoshifumi, to Tokyo Electron Limited. Cooling of a plasma electrode system for an etching apparatus. 4,963,713, Cl. 219-121.430.

Horiuchi, Tetsuya: *See*—
Ida, Kozo; and Horiuchi, Tetsuya, 4,963,624, Cl. 525-309.000.
Hornbossel, Scott C., to Exxon Production Research Company. Method for seismic trace interpolation. 4,964,098, Cl. 367-73.000.
Horvath, Jeno L., to Xerox Corporation. Multi-document editing. 4,963,932, Cl. 355-218.000.
Horwill, Gregory M.: *See*—
Horwill, Rodney E.; and Horwill, Gregory M., 4,962,959, Cl. 296-95.100.
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Hosaka, Akio; and Tanaka, Kenichi, to Nissan Motor Company Limited. Throttle control system for internal combustion engine with vehicle driving condition-dependent throttle angle correction coefficient variable. 4,962,570, Cl. 123-399.000.
Hosaka, Yukio: *See*—
Satake, Toshihiko; Satake, Satoru; and Hosaka, Yukio, 4,963,743, Cl. 250-339.000.
Hosel, Fritz, to Truzschler GmbH & Co. KG. Method and apparatus for obtaining measuring values representing the thickness of a coherent fiber mass. 4,962,569, Cl. 19-106.00R.
Hoshizaki, Tatsuji; and Sakamoto, Norio, to Konica Corporation. Method of reading a bar code on a moving cylindrical body. 4,963,718, Cl. 235-462.000.
Hosiden Electronics Co., Ltd.: *See*—
Aoki, Shigeo; Ugai, Yasuhiro; Miyake, Katsumi; and Okamoto, Kotaro, 4,963,503, Cl. 437-41.000.
Hosoki, Akira: *See*—
Ichimura, Kunihiro; Suzuki, Yasuzo; Seki, Takahiro; Sakuragi, Masako; Tamaki, Takashi; Hosoki, Akira; and Aoki, Koso, 4,963,448, Cl. 430-20.000.
Hosomizu, Hiroshi: *See*—
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Tsuji, Kenji; Omaki, Takanobu; and Makai, Masaaki, 4,963,914, Cl. 354-413.000.
Hotomi, Hideo, to Minolta Camera Kabushiki Kaisha. Image forming apparatus utilizing plural electric field generating arrangements so as to deposit developer particles supplied from a developer chamber. 4,962,723, Cl. 118-654.000.
Hotten, Terrence M.; Timms, Graham H.; and Tupper, David E., to Lilly Industries Limited. Pyrazolo-[3,4-g]isoquinoline derivatives useful to treat CNS disorders. 4,963,558, Cl. 514-293.000.
House, John R. C., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Damping treatment for pipes and bodies. 4,962,826, Cl. 181-207.000.
Hoyt, Douglas C.; and Callum, William M. Vapor purification apparatus. 4,963,166, Cl. 55-316.000.
Hsiao, Chi-Nung W.: *See*—
Schoenleber, Robert W.; Kebabian, John W.; Martin, Yvonne C.; DeNinno, Michael P.; Perner, Richard J.; Stout, David M.; Hsiao, Chi-Nung W.; DiDomenico, Stanley, Jr.; DeBernardis, John F.; Basha, Fatima Z.; Meyer, Michael D.; and De, Biswanath, 4,963,568, Cl. 514-320.000.
Hsieh, Edward P.; McMahon, Maurice T.; and Schnurmann, Henri D., to International Business Machines Corporation. Diagnostics of a board containing a plurality of hybrid electronic components. 4,963,824, Cl. 324-158.00R.
Hsieh, Kai-lin: *See*—
Chou, Ching-Liang; and Hsieh, Kai-lin, 4,962,790, Cl. 137-599.000.
Huang, Tiao-Yuan, to Xerox Corporation. Method for fabricating double implanted LDD transistor self-aligned with gate. 4,963,504, Cl. 437-44.000.
Huber, Anton: *See*—
Heindl, Friedrich; Schnuecker, Franz; and Huber, Anton, 4,963,302, Cl. 264-40.400.
Huber, Gordon R.; and Schmelzle, Lawrence E., to Wenger Manufacturing, Inc. Screw refiner. 4,963,033, Cl. 366-81.000.
Huber, John J. Race water track toy. 4,963,116, Cl. 446-176.000.
Huber, Roy L. Auxiliary vehicle deck. 4,962,709, Cl. 108-44.000.
Hubert, Jean-Luc, to Liquid Air Corporation. Efficiency process and apparatus for embrittling an outer protective coating of a pipe or pipeline. 4,963,205, Cl. 156-80.000.
Huegli, Ronald, to Mono-Lite Corporation. Structural unitary composite laminate structure and method for making same. 4,963,408, Cl. 428-71.000.
Huels Aktiengesellschaft: *See*—
Ruback, Wulf; Schut, Jan; Friedrich, Werner; Riemer, Heinz; and Steinhardt, Hauke, 4,963,274, Cl. 252-8.750.
Huene, Donald R. Bone screw fixation assembly, bone screw therefor and method of fixation. 4,963,144, Cl. 606-73.000.
Huff, G. David: *See*—
Rodkey, L. Scott; and Huff, G. David, 4,963,236, Cl. 204-183.200.
Hughes Aircraft Company: *See*—
Kaspaul, Alfred F., 4,963,401, Cl. 427-388.100.
Kim, Sachol E., 4,964,125, Cl. 371-20.000.
Phan, Dzung V.; and Minds, Kevin S., 4,962,689, Cl. 89-1.703.
Hughes, Timothy R.; and Siebert, Theodore A., Jr. Protective boat hull device. 4,962,719, Cl. 114-343.000.
Humble, David R., to CheckRobot, Inc. Self-checkout of produce items. 4,964,053, Cl. 364-466.000.
Humphries, Martyn; Nemcek, Jozef; Jaworzyn, Joseph F.; Cantwell, John B.; and Gerrard, John J., to Imperial Chemical Industries plc. Oral hygiene compositions and polymers active therein. 4,963,347, Cl. 424-49.000.
Hung, William M.; and Su, Kai C., to Ciba-Geigy Corporation. Reactive uv absorbing compositions and method of preparing lenses therefrom. 4,963,160, Cl. 8-507.000.
Husa, William: *See*—
Gornstein, Robert J.; Rust, Richard J.; Husa, William; and Rust, Randolph J., 4,962,718, Cl. 114-274.000.
Hutchings, Richard S.; Nolte, Saundra L.; and Weaver, Jeffrey S., to Drackett Company, The. Aqueous alkali metal halogenite compositions. 4,963,287, Cl. 252-187.230.
Hutter, Gerhard P. Dowel fastening device. 4,963,051, Cl. 403-298.000.
Hutton/PRC Technology Partners 1: *See*—
Woods, William E.; Lemay, Richard A.; and Wallace, David A., 4,964,037, Cl. 364-200.000.
Huxtable, William P.; Griffith, William L.; and Compere, Alicia L., to United States of America, Energy. Process for degrading hypochlorite and sodium hypochlorite. 4,963,341, Cl. 423-499.000.
Hydrotech Chemical Corporation: *See*—
Gerth, Wilfred B.; and Deocampo, Eduardo R., 4,962,908, Cl. 248-674.000.
Hygeia Sciences, Inc.: *See*—
Lennon, Donald J.; and Foster, Paul B., 4,963,325, Cl. 422-61.000.
Hyodo, Toru; and Orii, Akira, to Janome Sewing Machine Co. Ltd. Device for controlling finish-up stitching in an electronic computer sewing machine. 4,962,715, Cl. 112-451.000.
Ichikawa, Akira; Iihoshi, Akira; Nakamura, Yukinobu; and Yasui, Shinichiro, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for displaying travel path. 4,963,865, Cl. 340-995.000.
Ichikawa, Noriyoshi: *See*—
Ogawa, Toshio; Katakura, Kageyoshi; Kondo, Shin-ich; Umemura, Shin'ichiro; Ikeda, Hiroshi; Ichikawa, Noriyoshi; and Kuriyama, Kinji, 4,962,667, Cl. 73-626.000.
Ichimura, Hiroshi: *See*—
Aramaki, Minoru; Nakagawa, Shinsuke; Nakano, Hisaji; Ichimura, Hiroshi; and Tainaka, Masahiro, 4,964,137, Cl. 372-59.000.
Ichimura, Kunihiro; Suzuki, Yasuzo; Seki, Takahiro; Sakuragi, Masako; Tamaki, Takashi; Hosoki, Akira; and Aoki, Koso, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Photorecording element and liquid crystal cell comprising the same. 4,963,448, Cl. 430-20.000.
Ichinose, Makoto: *See*—
Satoh, Isao; Ichinose, Makoto; Fukushima, Yoshihisa; Kuroki, Yuzuru; Takagi, Yuji; and Azumatani, Yasushi, 4,964,094, Cl. 369-59.000.
Ichiyoshi, Hiroyuki; and Kashimura, Kazunori, to Canon Kabushiki Kaisha. Video camera apparatus with grip axis and viewfinder optical axis in parallel relation. 4,963,987, Cl. 358-229.000.
Ida, Kozo; and Horiuchi, Tetsuya, to Mitsubishi Rayon Co., Ltd. Process for producing light-diffusing methacrylic resin article. 4,963,624, Cl. 525-309.000.
Idemitsu Kosan Company, Limited: *See*—
Honna, Kosaku; and Seiki, Hiromichi, 4,963,292, Cl. 252-56.00S.
Identitech: *See*—
Torre, John J.; and Drummy, Michael, 4,963,880, Cl. 343-866.000.
Ido, Mikio: *See*—
Kurando, Shigeo; Makiura, Yoshinori; Shigemura, Yutaka; Ooura, Junichi; Mifune, Eiji; Imafuku, Tatsuo; Komata, Hiroshi; and Ido, Mikio, 4,963,939, Cl. 355-260.000.
Igen, Inc.: *See*—
Kim, Peter S.; and Kallenbach, Neville R., 4,963,355, Cl. 424-85.800.
Iihoshi, Akira; Nakamura, Yukinobu; Matsumoto, Yoshiyuki; and Nishio, Tomoyuki, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for displaying travel path. 4,963,864, Cl. 340-995.000.
Iihoshi, Akira: *See*—
Ichikawa, Akira; Iihoshi, Akira; Nakamura, Yukinobu; and Yasui, Shinichiro, 4,963,865, Cl. 340-995.000.
Iino, Tadashi, to Yazaki Corporation. Indication display unit for vehicles. 4,962,998, Cl. 350-174.000.
Ikeda, Hiroshi: *See*—
Ogawa, Toshio; Katakura, Kageyoshi; Kondo, Shin-ich; Umemura, Shin'ichiro; Ikeda, Hiroshi; Ichikawa, Noriyoshi; and Kuriyama, Kinji, 4,962,667, Cl. 73-626.000.
Ikeda, Koki: *See*—
Shimogori, Kazutoshi; Satoh, Hiroshi; Toyama, Masao; Nishimoto, Hidetoshi; Ikeda, Koki; and Kawafuku, Junji, 4,963,440, Cl. 428-651.000.
Ikeda, Takahide: *See*—
Watanabe, Atsuo; Yazawa, Yoshiaki; Hiraishi, Atsushi; Minami, Masataka; Nagano, Takahiro; Ikeda, Takahide; and Momma, Naohiro, 4,963,973, Cl. 357-42.000.
Ikeda, Teppei: *See*—
Ogawa, Masashi; Shiraishi, Hisashi; and Ikeda, Teppei, 4,963,243, Cl. 204-299.00R.
Ikemura, Masayuki; Karasaki, Takehiko; and Inoue, Manabu, to Minolta Camera Kabushiki Kaisha. Brightness measuring apparatus for providing adequate object brightness and a flashlight emission apparatus providing adequate exposure, irrespective of photographing conditions. 4,963,915, Cl. 354-432.000.
Ikenaga, Takao; Shigematsu, Toshifumi; Yada, Masatoshi; Makita, Shigeru; and Kitaura, Hitoshi, to Toto, Ltd.; and Omron Tateisi Electronics Co. Toilet with urine constituent measuring device. 4,962,550, Cl. 4-420.000.
Ikezawa, Katsuo: *See*—
Iwakuma, Takeo; Sekine, Yasuo; Sasaki, Yasuhiko; Ikezawa, Katsuo; and Odawara, Akio, 4,963,587, Cl. 514-562.000.

Ikumi, Tomonori: *See*—
Murakami, Kazunori; Matsumoto, Yasuo; Ikumi, Tomonori; and Sato, Shoichi, 4,962,981, Cl. 350-6.700.
Ilgenstein, Kerry A.: *See*—
Agrawal, Om P.; Ilgenstein, Kerry A.; Wright, Michael J.; Moench, Jerry D.; and Khu, Arthur H., 4,963,768, Cl. 307-465.000.
Illinois State University: *See*—
Foster, John W.; and Fryda, Lawrence J., 4,963,019, Cl. 356-28.000.
Illinois Tool Works Inc.: *See*—
Kish, Frederick A.; and Vadhar, Parimal M., 4,963,430, Cl. 428-220.000.
Im, Jang-hi; and Chau, C. C., to Dow Chemical Company, The. Process for preparing microporous membranes. 4,963,304, Cl. 264-49.000.
Imada, Eiji: *See*—
Katayama, Satoshi; Shimoda, Yoshihide; Sugimura, Hiroshi; Imada, Eiji; and Tsuchimoto, Shuhei, 4,963,451, Cl. 430-72.000.
Imafuku, Tatsuo: *See*—
Kurando, Shigeo; Makiura, Yoshinori; Shigemura, Yutaka; Ooura, Junichi; Mifune, Eiji; Imafuku, Tatsuo; Komata, Hiroshi; and Ido, Mikio, 4,963,939, Cl. 355-260.000.
Imai, Hisasi: *See*—
Saito, Masao; Tsukahara, Kengo; Yamada, Koichiro; and Imai, Hisasi, 4,963,687, Cl. 546-286.000.
Imai, Keisuke: *See*—
Hemmi, Keiji; Neya, Masahiro; Imai, Keisuke; Kayakiri, Natsuko; and Hashimoto, Masashi, 4,963,530, Cl. 514-19.000.
Imai, Toru: *See*—
Shibato, Kishio; Sakurai, Fumio; Sakai, Atsuhiro; Imai, Toru; and Ohe, Osamu, 4,963,601, Cl. 523-339.000.
Imaide, Takuya: *See*—
Todaka, Yoshihiro; Imaide, Takuya; Kinugasa, Toshiro; and Noda, Masaru, 4,963,981, Cl. 358-213.130.
Imaki, Naoshi: *See*—
Morita, Yoshiharu; Imaki, Naoshi; Shirataka, Tadashi; and Shimpuku, Tetsuro, 4,963,684, Cl. 546-90.000.
Imasaka, Yoshinobu: *See*—
Sumihara, Masanori; Imasaka, Yoshinobu; and Yoneno, Hiroshi, 4,963,781, Cl. 310-323.000.
Imazeki, Hideo: *See*—
Sato, Masaichi; and Imazeki, Hideo, 4,963,004, Cl. 350-403.000.
Imazu, Katsuhiro; Kobayashi, Tomomi; Ishinabe, Masao; and Iwamoto, Hisao, to Toyo Seikan Kaisha, Ltd. Redrawing method. 4,962,659, Cl. 72-349.000.
Immega, Guy B.: *See*—
Grodski, Juliusz J.; Immega, Guy B.; and Lawrence, Peter D., 4,964,061, Cl. 364-513.000.
Immucor, Inc.: *See*—
Sinor, Lyle T.; Eatz, Ralph A.; Stone, Darryl L.; and Plapp, Fred V., 4,963,478, Cl. 435-7.000.
Imon, Kazutoshi; Fukushima, Kensuke; and Shimizu, Hiroshi, to Kabushiki Kaisha Komatsu Seisakusho. Arrangement for controlling bulldozer blade. 4,962,816, Cl. 172-821.000.
Imperial Chemical Industries plc: *See*—
Brattan, Keith; Nevin, Morris N.; and Kelham, Stephen F., 4,963,235, Cl. 204-98.000.
Brattan, Keith, 4,963,241, Cl. 204-237.000.
Humphries, Martyn; Nemcek, Jozef; Jaworzyn, Joseph F.; Cantwell, John B.; and Gerrard, John J., 4,963,347, Cl. 424-49.000.
IMS-International Medical Service S.r.l.: *See*—
Affaitati, Peitro; Affaitati, Rosario; Sannino, Luigi; and Sannino, Bruno, 4,962,852, Cl. 206-222.000.
Inaba, Shinichi: *See*—
Shimizu, Masataka; Hori, Ryuichi; Kimura, Yoshio; Noma, Fumio; Isobe, Mitsutoshi; Kamijo, Tsunao; and Inaba, Shinichi, 4,963,186, Cl. 75-378.000.
Inadome, Kiyotaka, to Nikon Corporation. Zoom lens with inner or rear focusing system. 4,963,006, Cl. 350-427.000.
Inagaki, Mitsuo: *See*—
Sanuki, Masami; Itoigawa, Fumihiro; Kojima, Akikazu; Inagaki, Mitsuo; Yasuda, Masanori; Kurokawa, Yoshiki; Miyagawa, Kazuhito; Suzuki, Seiichiro; Iwanami, Shigeki; Kawasaki, Shiro; and Miura, Nobuhiro, 4,963,074, Cl. 417-222.000.
Inax Corporation: *See*—
Goto, Kazumasa; Shin, Hiroto; Ishida, Hideki; Goto, Yasuo; and Iwahashi, Akira, 4,963,517, Cl. 501-122.000.
INDENA S.p.A.: *See*—
Bombardelli, Ezio; and Sabadie, Michel, 4,963,527, Cl. 514-25.000.
Industrial Technology Research Institute: *See*—
Kung, Chien-Ping, 4,962,984, Cl. 350-6.800.
Ingermann, Donald E.; Smith, Ronald L.; Caffrey, Stephen F.; and Steinhoff, Lonney J., to Century International Corporation. Automatic vacuum bowling lane stripper. 4,962,565, Cl. 15-302.000.
Ingersoll-Rand Company: *See*—
Mayhew, Phillip A., 4,962,787, Cl. 137-556.300.
Sowards, Brian D., 4,963,041, Cl. 384-493.000.
Inokuti, Yukio: *See*—
Nishiike, Ujihiro; Kobayashi, Yasuhiro; Ishitobi, Hirotake; Sujita, Shigeko; Takahashi, Norio; Nakahara, Hisanao; and Inokuti, Yukio, 4,963,197, Cl. 148-111.000.
Inoue, Akiyoshi: *See*—
Saito, Yuji; Yamada, Kazuo; Inoue, Akiyoshi; and Takaoka, Yasuhiro, 4,962,578, Cl. 29-132.000.
Inoue, Hiromichi: *See*—
Saito, Shinichi; Miyazawa, Kazutoshi; Ohno, Kouji; and Inoue, Hiromichi, 4,963,288, Cl. 252-299.610.
Inoue, Hiroshi; Muramatsu, Tadao; and Hirano, Tetsuji, to Ube Industries, Ltd. Terminal-modified imide oligomer and solution composition of the same. 4,963,645, Cl. 528-342.000.
Inoue, Kazuo; Katoh, Masaaki; and Kishi, Noriyuki, to Honda Giken Kogyo Kabushiki Kaisha. Valve operating device for internal combustion engine. 4,962,732, Cl. 123-90.160.
Inoue, Manabu; Taniguchi, Nobuyuki; Hata, Yoshiaki; Hoda, Takeo; Kudo, Yoshinobu; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Photographic camera. 4,963,907, Cl. 354-222.000.
Inoue, Manabu: *See*—
Ikemura, Masayuki; Karasaki, Takehiko; and Inoue, Manabu, 4,963,915, Cl. 354-432.000.
Tanaka, Yoshihiro; Tsuji, Sadafusa; Hata, Yoshiaki; Inoue, Manabu; Ootsuka, Hiroshi; Iwata, Michihiro; Ishito, Fumiaki; and Hayama, Koh, 4,963,916, Cl. 354-435.000.
Taniguchi, Nobuyuki; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; Hoda, Takeo; and Ueda, Hiroshi, 4,963,917, Cl. 354-484.000.
Institut Francais du Petrole: *See*—
Jarrin, Jacques; and Robert, Eric, 4,963,420, Cl. 428-36.900.
Institut National de la Sante et de la Recherche Medicale (INSERM): *See*—
Cathignol, Dominique; Lacruche, Bernard; and Mestas, Jean-Louis, 4,962,753, Cl. 128-24.00A.
Institut National de la Sante et de la Researche Medicale: *See*—
Tchen, Paul, 4,963,477, Cl. 435-6.000.
Institut Pasteur: *See*—
Tchen, Paul, 4,963,477, Cl. 435-6.000.
Institute of Gas Technology: *See*—
Marianowski, Leonard G.; and Petri, Randy J., 4,963,442, Cl. 429-13.000.
Intel Corporation: *See*—
Mielke, Neal R., 4,963,825, Cl. 324-158.00R.
Tzeng, Jyh-Cherng J., 4,964,080, Cl. 365-185.000.
Intelligent Instrumentation, Inc.: *See*—
Jindrick, James A.; Page, L. Dennis; and Daniel, Richard A., 4,964,017, Cl. 361-390.000.
Interlink Electronics, Inc.: *See*—
Yaniger, Stuart I.; and Rivers, James P., 4,963,702, Cl. 178-18.000.
Intermedics Orthopedics, Inc.: *See*—
Hofmann, Aaron A.; and Skraba, Joseph S., 4,963,152, Cl. 623-18.000.
International Business Machines Corp.: *See*—
Azuchi, Isamu; Fujikura, Hiroshi; Haruna, Yoshinobu; Onomoto, Ryuichi; and Nishikawa, Masato, 4,962,919, Cl. 271-3.100.
Budd, Russell A.; Goddard, Joan S.; and Stanich, Mikel J., 4,963,900, Cl. 346-160.000.
Calvignac, Jean; Dauphin, Michel; Lenoir, Raymond; and Picard, Jean-Louis, 4,964,127, Cl. 371-37.100.
De Azevedo, Joao B., Jr.; and James, Peter N., 4,964,036, Cl. 364-200.000.
Eisen, Ivan R.; and Morris, Ruth A., 4,964,077, Cl. 364-900.000.
Ely, Joseph C., 4,964,069, Cl. 364-521.000.
Galbraith, Richard L; Richetta, Raymond A.; and Schmerbeck, Timothy J., 4,964,107, Cl. 368-120.000.
Geyer, Joel Erwin; Lee, Joseph K.; and Wilson, Kenneth T., 4,964,113, Cl. 370-85.500.
Hsieh, Edward P.; McMahon, Maurice T.; and Schnurmann, Henri D., 4,963,824, Cl. 324-158.00R.
Jeremiah, Thomas L.; Ruane, Albert J.; and Zurla, Frank A., 4,964,041, Cl. 364-200.000.
Louis, Philippe P. R.; Montanari, Gerard M.; and Leotard, Robert L., 4,964,038, Cl. 364-200.000.
Maldonado, Juan R., 4,964,145, Cl. 378-35.000.
International Flavors & Fragrances Inc.: *See*—
Sprecker, Mark A.; and Greene, Roger E., 4,963,285, Cl. 252-174.110.
International Paper Company: *See*—
Lisnyansky, Khaim; and Walbaum, H. Heinz, 4,963,229, Cl. 162-49.000.
Invacare Corporation: *See*—
Bly, Robert R., 4,962,551, Cl. 4-480.000.
Isaka, Tsutomu; and Yamashita, Toshihiro, to Toyo Boseki Kabushiki Kaisha. Thermo-shrinkable polyester type film and tube and processing method for preparing the tube. 4,963,418, Cl. 428-34.900.
Isao Takahashi: *See*—
Takahashi, Isao; and Iwata, Makoto, 4,962,976, Cl. 318-81.000.
Isayama, Katsuhiko: *See*—
Hirose, Toshifumi; and Isayama, Katsuhiko, 4,963,626, Cl. 525-403.000.
Iseda, Aturou: *See*—
Okuda, Takanari; Nomura, Shigeo; Shibahara, Itaru; Enokido, Yuji; Fujiwara, Masayuki; Nishida, Toshio; Teranishi, Hiroshi; Hirano, Susumu; Iseda, Aturou; and Nakajima, Motoharu, 4,963,200, Cl. 148-325.000.
Ishida, Hideki: *See*—
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Ishigaki, Kouji: *See*—
Sonoda, Yoshihide; Takagi, Yasuji; and Ishigaki, Kouji, 4,963,938, Cl. 355-260.000.
Ishihara, Hideo: *See*—
Fukasawa, Yoshiharu; Kawai, Mituo; Ishihara, Hideo; Umeki, Takenori; and Oana, Yasuhisa, 4,963,240, Cl. 204-192.150.

Ishihara, Hideshi, to Matsushita Electric Industrial Co., Ltd. Electrophotographic recording apparatus having a developer resupply control function. 4,963,927, Cl. 355-207.000.
Ishii, Katsumi: *See*—
Tajima, Akio; and Ishii, Katsumi, 4,964,115, Cl. 374-109.000.
Ishii, Kazuharu: *See*—
Okochi, Sadao; and Ishii, Kazuharu, 4,964,158, Cl. 379-322.000.
Ishii, Kohji: *See*—
Nemoto, Mitsugu; Ohmura, Atsuo; Koiso, Jun-ichi; and Ishii, Kohji, 4,963,940, Cl. 355-260.000.
Ishii, Mitsuaki: *See*—
Nishizawa, Hiroyuki; Kashiwabara, Kimito; Nako, Osamu; Ishii, Mitsuaki; Yamane, Kouichi; Miyazaki, Masaaki; and Nishiyama, Ryoji, 4,962,742, Cl. 123-492.000.
Ishii, Tamaki: *See*—
Fukui, Yoshiharu; Kuroda, Kazuhisa; Ishii, Tamaki; and Sasaki, Manji, 4,963,605, Cl. 524-108.000.
Ishikawa, Keiichi: *See*—
Shin, Masaaki; Hirayama, Nobuhiro; Ishikawa, Keiichi; and Misawa, Akira, 4,963,456, Cl. 430-109.000.
Ishikawa, Ko: *See*—
Kawashima, Yoshikazu; Ishikawa, Ko; Haruyama, Shinichi; and Sekiguchi, Fusao, 4,963,887, Cl. 342-44.000.
Ishikawa, Masanori: *See*—
Haraguchi, Shosuke; and Ishikawa, Masanori, 4,963,905, Cl. 354-152.000.
Ishikawa, Ryosuke: *See*—
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Brand, Gunter; Brammer, Hartmut; Gerber, Richard; Glockler, Otto; Grimm, Gerold; Gruber, Hans-Ulrich; Gunther, Dieter; Isler, Jorg; Kalippke, Harald; Lolhoffei, Wolfgang; Maurer, Helmut; Mayer, Ulrich; Plapp, Gunther; Renninger, Erhard; Ruppmann, Claus; Sailer, Harald; and Werner, Peter, 4,962,737, Cl. 123-339.000.
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Itakura, Haruo; and Ito, Kunio, to Konica Corporation. Copying apparatus. 4,963,922, Cl. 355-208.000.
Itek Graphix Corp.: *See*—
Lebeau, Donald R.; and Kalutkiewicz, Paul J., 4,963,894, Cl. 346-107.00R.
Ito, Kazuo; Matsuo, Shuitsu; and Sasaki, Yasumi, to Toshiba Ceramics Co., Ltd. Method for making an impregnated ceramic material. 4,963,396, Cl. 427-294.000.
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Ito, Kunio: *See*—
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Ito, Masaaki: *See*—
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Ito, Sukenori: *See*—
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Ito, Yoshiaki: *See*—
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Itoigawa, Fumihiro: *See*—
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Itoyama, Hiroshi: *See*—
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Iuchi, Kazushi: *See*—
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Iwamoto, Hisao: *See*—
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Brida, Pius, 4,964,092, Cl. 368-282.000.

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Utsunomiya, Masaaki; and Izawa, Fumio, 4,963,999, Cl. 360-72.300.

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Izumo Industrial Co., Ltd.: *See*—
Hiyama, Nobuo, 4,963,059, Cl. 407-60.000.

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J & S Wylde, Ltd.: *See*—
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Jachmann, Juerges: *See*—
Weitemeyer, Christian; Wewers, Dietmar; and Jachmann, Juergen, 4,963,438, Cl. 428-447.000.

Jackson, Allan W.: *See*—
Loomis, Gary A.; and Jackson, Allan W., 4,962,608, Cl. 43-18.100.

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Johansson, Lars-Erik; and Jacobsson, Per-Gunnar, 4,963,330, Cl. 422-168.000.

Jahn, Helmut: *See*—
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Jahnke, Richard L.: *See*—
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Jahnke, Ulrich: *See*—
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Jain, Anil K.: *See*—
Belinko, Keith; Khalbe, Chandra P.; and Jain, Anil K., 4,963,247, Cl. 208-112.000.

Jalbert, Ronald L.: *See*—
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James, Peter N.: *See*—
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James River Corporation of Virginia: *See*—
Gooding, Chester W., Jr.; and Mead, Maurice J., 4,963,406, Cl. 428-43.000.

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Baker, Stephen R.; Jamieson, William B., deceased; and Todd, Alec, 4,963,578, Cl. 514-381.000.

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Hyodo, Toru; and Orii, Akira, 4,962,715, Cl. 112-451.000.

Jansen, Daniel F.: *See*—
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Koshiba, Mitsunobu; Yamada, Keiichi; Harita, Yoshiyuki; Roland, Bruno; and Vandendriessche, Jan, 4,963,463, Cl. 430-191.000.

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Jarrin, Jacques; and Robert, Eric, to Institut Francais du Petrole. Filler and floatability material - manufacturing process and tubular units that incorporate this material. 4,963,420, Cl. 428-36.900.

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Bryan, Philip S.; Lambert, Patrick M.; Towers, Christine M.; and Jarrold, Gregory S., 4,963,753, Cl. 250-483.100.
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Jaskowiak, Kenneth R., to Raytheon Company. Synchronized processing system with bus arbiter which samples and stores bus request signals and synchronizes bus grant signals according to clock signals. 4,964,034, Cl. 364-200.000.

Jaworski, Roy D.: *See*—
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Jaworzyn, Joseph F.: *See*—
Humphries, Martyn; Nemcek, Jozef; Jaworzyn, Joseph F.; Cantwell, John B.; and Gerrard, John J., 4,963,347, Cl. 424-49.000.

Jazdzyk, Matt, Jr. Golf putter. 4,962,931, Cl. 273-164.000.

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Jen, Kwan-Yue: *See*—
Shacklette, Lawrence W.; Jen, Kwan-Yue; Eckhardt, Helmut; Elsenbaumer, Ronald L.; and Baughman, Ray H., 4,963,206, Cl. 156-99.000.

Jenekhe, Samson A., to Honeywell Inc. Complexation-mediated solubilization of polymers. 4,963,616, Cl. 524-600.000.

Jenkins, Jerome D., to Stork Screens B.V. Process for the production of a coated product, thin-walled coated cylinder obtained by using said process, and an ink transfer roller comprising such a cylinder. 4,963,404, Cl. 428-34.700.

Jennings-White, Clive: *See*—
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Clarke, Graham J.; Hibbert, Gordon E.; Jensen, Helge; and Clabburn, Robin J. T., 4,963,819, Cl. 324-126.000.

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Jeremiah, Thomas L.; Ruane, Albert J.; and Zuria, Frank A., to International Business Machines Corporation. Interruptible cache loading to assure immediate data access from cache. 4,964,041, Cl. 364-200.000.

Jesch, Norman L., to Adolph Coors Company. Method and apparatus for forming carton blanks. 4,963,126, Cl. 493-354.000.

Jindrick, James A.; Page, L. Dennis; and Daniel, Richard A., to Intelligent Instrumentation, Inc. Adaptable housing for embedding of computer-controlled products. 4,964,017, Cl. 361-390.000.

Johansson, Eric B.; and Curulla, Michael V., to General Electric Company. Spring lock washer for tie rod nuts. 4,963,318, Cl. 376-446.000.

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Agee, John M.; and King, Francis, 4,963,147, Cl. 606-170.000.

Johnson, A. David, Jr.; and Bachman, Joseph L., Jr., to Wayne Automation Corporation. Container packing machines. 4,962,625, Cl. 53-157.000.

Johnson, Derwyn C.: *See*—
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Johnson, James H., to Conoco Inc. Three dimensional before stack depth migration of two dimensional or three dimensional seismic data. 4,964,103, Cl. 367-53.000.

Johnstone, Edna M. Coffee filter paper retainer. 4,963,262, Cl. 210-474.000.

Jolley, Scott T.; and Butke, Betsy J., to Lubrizol Corporation, The. Liquid compositions containing thiocarbamates. 4,963,282, Cl. 252-67.000.

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Jones, Dallas W., to Trim-A-Lawn Corporation. Rotary cutting member with flexible filaments for use with lawnmowers and the like. 4,962,630, Cl. 56-12.700.

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Jones, Robert W., to Mesa, Inc. Orthopedic restraint apparatus. 4,962,760, Cl. 128-80.00F.

Jones, Thomas R.; and Gould, Caryl, to ECC International Limited. Coated porous mullite bodies. 4,963,436, Cl. 428-403.000.

Jones, Trevor M.; and White, Alan R., to Burroughs Wellcome Co. Formulations of heterocyclic compounds. 4,963,555, Cl. 514-262.000.

Jong, Jiunn-Neng. Apparatus for counting lump foodstuffs. 4,963,720, Cl. 235-98.00R.

Jonner, Wolf-Dieter; Braschel, Volker; Roller, Dieter; and Demel, Herbert, to Robert Bosch GmbH. Anti-lock braking system. 4,962,970, Cl. 303-100.000.

Jorgensen, Iner M., to Paccar Inc. Electrically driven, circumferentially supported fan. 4,962,734, Cl. 123-41.490.

Jossens, Lawrence W.: *See*—
Zones, Stacey I.; Holtermann, Dennis L.; Santilli, Donald S.; Jossens, Lawrence W.; Kennedy, James V.; and Rainis, Andrew, 4,963,337, Cl. 423-277.000.

Journeau, Remy, to Thomson-CSF. Method for the fast synchronization of vocoders coupled to one another by enciphering. 4,964,165, Cl. 380-48.000.

Jung, Roger E.; and Mills, Brian P., to Telephone Cables Limited. Clamping apparatus for an array of optical fiber filaments. 4,962,989, Cl. 350-96.200.

Jung, Tae-Sung; and Choi, Kyu-Hyun, to SamSung Electronics Co., Ltd. Static random access memory device with voltage control circuit. 4,964,084, Cl. 365-226.000.

JWI, Inc.: *See*—
DeHaan, Daniel; Brinks, Michael J.; and Steketee, Sherwood, 4,963,255, Cl. 210-230.000.

Kaakkola, Seppo K.: *See*—
Backstrom, Reijo J.; Heinola, Kalevi E.; Honkanen, Erkki J.; Kaakkola, Seppo K.; Kairisalo, Pekka J.; Linden, Inge-Britt Y.; Mannisto, Pekka T.; Nissinen, Erkki A. O.; Pohto, Pentti; Pippuri, Aino K.; and Pystynen, Jarmo J., 4,963,590, Cl. 514-678.000.

Kabelitz, Hans-Peter: *See*—
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Kabushika Kaisha Toshiba: *See*—
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Kabushiki Kaisha Kobe Seiko Sho: *See*—
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Kabushiki Kaisha Meiki Seisakusho: *See*—
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Aoshima, Akihiko, 4,964,157, Cl. 379-204.000.
Fukasawa, Yoshiharu; Kawai, Mituo; Ishihara, Hideo; Umeki, Takenori; and Oana, Yasuhisa, 4,963,240, Cl. 204-192.150.
Homma, Katsuhisa; Nikaido, Masaru; Ouchi, Yoshiaki; Yamazaki, Mutsuki; and Yoshizawa, Shuji, 4,963,893, Cl. 346-76.0PH.
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Kumano, Akira; Sugiura, Yumiko; and Aoyama, Chiaki, 4,964,044, Cl. 364-419.000.
Manabe, Sohei; Matsunaga, Yoshiyuki; and Harada, Nozomu, 4,963,956, Cl. 357-30.00H.
Masuda, Masami, 4,963,774, Cl. 307-585.000.
Matsuda, Kyoya; Fujioka, Yoshiharu; and Tsutaki, Shoji, 4,962,584, Cl. 29-603.000.
Miwa, Yoshiyuki; and Wada, Takashi, 4,962,693, Cl. 99-283.000.
Moriya, Kazunori; Takagi, Nobuyuki; Sugaya, Toshihiro; and Nakamura, Norio, 4,964,009, Cl. 360-135.000.
Nara, Seietsu; and Kawagishi, Toshiyuki, 4,964,072, Cl. 364-705.080.
Nezu, Yukihiro, 4,963,934, Cl. 355-235.000.
Obama, Masao; and Kikuchi, Masaaki, 4,963,818, Cl. 324-117.00R.
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Kaspaul, Alfred F., to Hughes Aircraft Company. Method and composition for protecting and enhancing the solderability of metallic surfaces. 4,963,401, Cl. 427-388.100.

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Kathi, Karl; Patterson, John H.; Lowe, Tony M.; Val, Yefim; Bernadic, Thomas J.; and Brockett, Brendan L., to GTE Valenite Corporation. Ceramic cutting insert. 4,963,061, Cl. 407-114.000.

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Kaup, Ludger, to Aug. Winkhaus GmbH & Co. KG. Drive rod lock. 4,962,653, Cl. 70-107.000.

Kauvar, Lawrence M., to Terrapin Technologies, Inc. Method of identity analyte-binding peptides. 4,963,263, Cl. 210-635.000.

Kawabuchi, Yoichi, to Minolta Camera Kabushiki Kaisha. Copying apparatus. 4,963,935, Cl. 355-245.000.

Kawada, Susumu: *See*—
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Kawai, Mituo: *See*—
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Kawai, Tohru, to Canon Kabushiki Kaisha. Lens barrel. 4,963,000, Cl. 350-254.000.

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Kawakami, Yasushi; Hirata, Keiichi; Kamisaka, Mizuho; Mukai, Miyako; Ban, Tomohiro; and Ooishi, Minoru, to Brother Kogyo Kabushiki Kaisha. Horizontal line position adjusting in frame processing device. 4,963,042, Cl. 400-17.000.

Kawakami, Yoshinobu: *See*—
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Kawamata, Toshio: *See*—
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Kawame, Keisuke; Asano, Toshio; and Mochizuki, Jun, to Hitachi, Ltd. Picture quality testing method and apparatus for color cathode-ray tube. 4,963,823, Cl. 324-404.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Etoh, Hideyuki; Shida, Kozo; Tange, Toshiyuki; and Shiotani, Yoshio, 4,963,712, Cl. 219-86.900.
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Kawasaki, Shinji, to NGK Insulators, Ltd. SiC complex sintered bodies and production thereof. 4,963,516, Cl. 501-90.000.

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Kawase, Mitsuru; Tanimura, Masashi; Terasawa, Hidekazu; Nakamura, Sohei; Nagano, Takayuki; Higashimori, Shosuke; Matsuki, Hiroshi; and Matsumoto, Hisashi, to Oji Paper Company Ltd.; Kuraray Co., Ltd.; and Nihon Tensaiseito Kabushiki Kaisha. Agricultural paper and process for producing the same. 4,963,230, Cl. 162-129.000.

Kawashima, Yoshikazu; Ishikawa, Ko; Haruyama, Shinichi; and Sekiguchi, Fusao, to Yamatake-Honeywell Co., Ltd.; and Yokowo Mfg. Co., Ltd. Full duplex transponder system. 4,963,887, Cl. 342-44.000.

Kawazi, Toshikuni, to Teikoku Seiyaku Kabushiki Kaisha. Etofenamate-containing adhesive tape. 4,963,361, Cl. 424-443.000.

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Kebabian, John W.: *See*—
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Keller, Ronald C.: *See*—
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Kelly, Michael C.; and Lindsay, Richard O., to Amoco Corporation. Method for enhancing and evaluating seismic data. 4,964,102, Cl. 367-47.000.
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Kerwin, Michael J., to Sherwood Medical Company. Floatation chamber for use in a chest drainage device. 4,963,135, Cl. 604-320.000.
Kessler, Hans: *See*—
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Khan, Mirza M. T.; and Siddiqui, M. R. H., to Council of Scientific and Industrial Research. Process for the preparation of clay loaded metal complexes catalyst and a process for the hydrogenation of oils using the catalyst so prepared. 4,963,295, Cl. 260-409.000.
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Kikuchi, Juro, to Olympus Optical Co., Ltd. Compact zoom lens system. 4,963,010, Cl. 350-481.000.
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Yato, Tadao; Tanaka, Hiroshi; Kikuchi, Toshiaki; and Onoshita, Toshio, 4,963,294, Cl. 252-636.000.
Kildal, Per-Simon. Reflector antenna with a self-supported feed. 4,963,878, Cl. 343-781.00P.
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Kim, Sachol E., to Hughes Aircraft Company. Method and apparatus for diagnosing faults. 4,964,125, Cl. 371-20.000.
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Brandel, Charles W.; Kim, San; Wiecek, Charles S.; and Heinze, Richard F., 4,963,374, Cl. 426-107.000.
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Kimrey, Harold D., Jr., to United States of America, Energy. Method and device for microwave sintering large ceramic articles. 4,963,709, Cl. 219-10.55M.
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Shimizu, Masataka; Hori, Ryuichi; Kimura, Yoshio; Noma, Fumio; Isobe, Mitsutoshi; Kamijo, Tsunao; and Inaba, Shinichi, 4,963,186, Cl. 75-378.000.
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Saito, Makoto; Watanabe, Teruo; Yahagi, Shinichiro; Kasai, Yasuaki; Yoshikawa, Norio; Yoshida, Yutaka; Kinami, Toshiya; and Yamada, Hiyoshi, 4,963,320, Cl. 419-12.000.
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King, Charles, to Courser, Incorporated. Optical level measurement system. 4,963,731, Cl. 250-560.000.
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Kinyosha Co., Ltd.: *See*—
Saito, Yuji; Yamada, Kazuo; Inoue, Akiyoshi; and Takaoka, Yasuhiro, 4,962,578, Cl. 29-132.000.
Kipphan, Helmut, to Heidelberger Druckmaschinen AG. Register-measuring system. 4,963,029, Cl. 356-401.000.
Kirstein, Gerhard, to Renk Aktiengesellschaft. Electronic control device for a drive system. 4,962,680, Cl. 74-866.000.
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Foster, Dean H.; Wright, William J.; and Kish, Richard E., 4,962,624, Cl. 53-76.000.
Kishi, Kazuya: *See*—
Yakuwa, Masahiko; Tomozawa, Kikuo; and Kishi, Kazuya, 4,964,050, Cl. 364-431.040.
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Inoue, Kazuo; Katoh, Masaaki; and Kishi, Noriyuki, 4,962,732, Cl. 123-90.160.
Kishii, Ryuji; and Takemiya, Akinori, to Bridgestone Corporation. Cell film breaking apparatus for foamed products. 4,963,085, Cl. 425-385.000.
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Kitajima, Tadayuki; Asakawa, Toshiyuki; Naito, Masataka; Matsuo, Kazuhiro; and Murayama, Toshiaki, to Canon Kabushiki Kaisha. Sheet sorting device. 4,962,920, Cl. 271-293.000.
Kitamura, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Vehicular a.c. generator having improved cooling structure. 4,963,776, Cl. 310-64.000.
Kitaura, Hiromu; Isobe, Mitsuo; Ninomiya, Yuichi; Ohtsuka, Yoshimichi; and Izumi, Yoshinori, to Matsushita Electric Industrial Co., Ltd.; and Nippon Hoso Kyokai. Automatic gain control device. 4,963,969, Cl. 358-174.000.
Kitaura, Hitoshi: *See*—
Ikenaga, Takao; Shigematsu, Toshifumi; Yada, Masatoshi; Makita, Shigeru; and Kitaura, Hitoshi, 4,962,550, Cl. 4-420.000.
Klein, Heinz: *See*—
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Klemann, Lawrence P.; and Finley, John W., to Nabisco Brands, Inc. Complex linked ester low calorie fat mimetics. 4,963,386, Cl. 426-611.000.
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Klingert, Bernd; Sitek, Franciszek; and Rembold, Manfred, to Ciba-Geigy Corporation. Titanocenes and their use. 4,963,470, Cl. 430-281.000.
Kloosterhouse, Donald H., to Ermanco Incorporated. Opposite direction transfer device. 4,962,841, Cl. 198-372.000.
Kloss, Hans-Georg: *See*—
Gottschling, Wolfgang; Guenther, Klaus; Kloss, Hans-Georg; Radtke, Rainer; and Serick, Felix, 4,963,796, Cl. 315-246.000.
Klostermann, Heinrich F.; and Braun, Martin, to Meicor, Inc. Air cooled metal ceramic x-ray tube construction. 4,964,148, Cl. 378-127.000.
Kluth, Hans-Jurgen, to Deutsche Thomson-Brandt GmbH. Video recorder with increased bandwidth recording. 4,963,993, Cl. 358-330.000.
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Knights, Peter: *See*—
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Kniskern, Peter J.: *See*—
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Knobloch, Jurgen: *See*—
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Ricciardi, Michael A.; and Teumac, Fred N., 4,963,593, Cl. 521-128.000.
Knowles, Carl H., to Metrologic Instruments, Inc. Laser scanner engine with folded beam path. 4,962,980, Cl. 350-6.600.
Kobayashi, Eiji, to Mitsubishi Denki Kabushiki Kaisha. Connective jumper and method of manufacturing the same. 4,962,585, Cl. 29-885.000.
Kobayashi, Hisashi: *See*—
Nagai, Yoshitaka; Shibayama, Shohei; Numata, Masaaki; Yoshimura, Shoji; Tanaka, Makoto; Ito, Masayoshi; Awaya, Akira; Kobayashi, Hisashi; Abe, Hayao; Ishizuka, Yusaku; and Ogawa, Tomoya, 4,963,653, Cl. 530-322.000.
Kobayashi, Masao: *See*—
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Kobayashi, Yasuhiro: *See*—
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Kobbing, Heinz: *See*—
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Kobe Steel, Ltd.: *See*—
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Kobishi Electric Co., Inc. Ltd.: *See*—
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Kobori, Keiichi: *See*—
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Koda, Masatoshi; and Araki, Kazuyuki, to Mitsubishi Jukogyo Kabushiki Kaisha. Marine contra-rotating propeller drive system. 4,963,108, Cl. 440-81.000.
Kodato, Setsuo; and Nakamura, Masao, to Anritsu Corporation. Electric resistor and a power detector both comprising a thin film conductor. 4,963,195, Cl. 136-225.000.
Kodl, David A., to Ampex Corporation. Purge enclosure for electrical equipment in hazardous location. 4,963,693, Cl. 174-11.00R.
Koerner, Norman D.: *See*—
Brooks, Royce L., 4,963,762, Cl. 297-183.000.
Koerper, Hans, to Vivaria GmbH, Import von Pflanzen und Tieren. Perforated plant vessel for epiphytes. 4,962,614, Cl. 47-66.000.
Koflach Sport Gesellschaft m.b.H. & Co. KG: *See*—
Perner, Johann, 4,962,595, Cl. 36-121.000.
Koga, Masataka: *See*—
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Kohiyama, Kiyoshi; and Takahashi, Hidenaga, to Fujitsu Limited. Method and apparatus for detecting a phase difference between two digital signals. 4,963,817, Cl. 324-83.00D.
Kohler, Wolfgang. Mold for dentistry. 4,962,909, Cl. 249-54.000.
Kohno, Akiyoshi; and Mikoshiba, Atsushi, to NEC Corporation. Ccd image sensor with vertical overflow drain. 4,963,983, Cl. 358-213.310.
Kohno, Mitsunori; Umebara, Takao; Kurimoto, Yukuo; Fujii, Nobuhiko; and Akita, Hiromasa, to Tokyo Electric Company, Ltd. Rotatable bar code reader arrangement for a check out system. 4,963,721, Cl. 235-462.000.
Kohzaki, Toshiaki: *See*—
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Koizumi, Takashi; and Uekusa, Tadashi, to Fuji Photo Film Co., Ltd. Optical fiber connector and optical density measuring system. 4,963,027, Cl. 356-416.000.
Kojima, Akikazu: *See*—
Sanuki, Masami; Itoigawa, Fumihiro; Kojima, Akikazu; Inagaki, Mitsuo; Yasuda, Masanori; Kurokawa, Yoshiki; Miyagawa, Kazuhito; Suzuki, Seiichiro; Iwanami, Shigeki; Kawasaki, Shiro; and Miura, Nobuhiro, 4,963,074, Cl. 417-222.000.
Kojima, Keiichi: *See*—
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Kojima, Yoshikazu, to Kobishi Electric Co., Inc. Ltd. Warning sound generating device. 4,963,855, Cl. 340-391.000.
Kokeguchi, Akira, to Takata Corporation. Sheet material for vehicle safety air bags. 4,963,412, Cl. 428-137.000.
Koken Ltd.: *See*—
Tajima, Tomoyuki, 4,963,358, Cl. 424-548.000.
Kokura, Masuo, to Fanuc Ltd. Numerically controlled machine tool. 4,963,803, Cl. 318-569.000.
Kolin, Ivo: *See*—
Skobic, Davor; and Kolin, Ivo, 4,962,700, Cl. 99-470.000.
Komata, Hiroshi: *See*—
Kurando, Shigeo; Makiura, Yoshinori; Shigemura, Yutaka; Ooura, Junichi; Mifune, Eiji; Imafuku, Tatsuo; Komata, Hiroshi; and Ido, Mikio, 4,963,939, Cl. 355-260.000.
Kombinat VEB Narva: *See*—
Gottschling, Wolfgang; Guenther, Klaus; Kloss, Hans-Georg; Radtke, Rainer; and Serick, Felix, 4,963,796, Cl. 315-246.000.
Komiya, Fuminori: *See*—
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Komoda, Tsutomu: *See*—
Okamoto, Yukio; Komoda, Tsutomu; Shimura, Satoshi; Murayama, Seiichi; and Koga, Masataka, 4,963,735, Cl. 250-288.000.
Komori, Norio, to SSMC Inc. Thread end disposal unit in a thread cutting sewing machine. 4,962,714, Cl. 112-287.000.
Komp, Karl-Heinz, to Schumag AG, Firma. Method and apparatus for straight drawing a pipe. 4,962,658, Cl. 72-283.000.
Kondo, Kazuo; and Morikawa, Asao, to NGK Spark Plug Co., Ltd. Metallizing paste for circuit board having low thermal expansion coefficient. 4,963,187, Cl. 106-1.140.
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Sugaya, Nobuyasu; Kondo, Munetaka; Murashita, Kikuji; and Kobayashi, Motoi, 4,964,059, Cl. 364-507.000.
Kondo, Shin-ich: *See*—
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Kondoh, Norihito: *See*—
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Ishikawa, Sadayasu; Tsukamoto, Masaru; and Yagi, Toshihiko, 4,963,467, Cl. 430-567.000.
Isoguchi, Seiichi; Murai, Yoshio; Takayama, Jun; and Nagaishi, Katsuya, 4,963,985, Cl. 358-227.000.
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Kano, Akiko; Tsuchino, Hisanori; Nakano, Kuniaki; Shimada, Fumio; and Honda, Satoshi, 4,963,751, Cl. 250-484.100.
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Nagasawa, Shigeru; Noziri, Hisao; Nakai, Yoshizumi; Araki, Yasuaki; Sakamoto, Eizo; Yagasaki, Masao; and Kozima, Mutsumi, 4,963,611, Cl. 524-459.000.
Konishi, Yoshihiro; Konno, Kenichi; Awai, Ikuo; and Hikuma, Hideo, to Uniden Corporation. Dielectric waveguide-type filter. 4,963,844, Cl. 333-208.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
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Konishi, Yoshihiro; Konno, Kenichi; Awai, Ikuo; and Hikuma, Hideo, 4,963,844, Cl. 333-208.000.
Koshiba, Mitsunobu; Yamada, Keiichi; Harita, Yoshiyuki; Roland, Bruno; and Vandendriesshe, Jan, to Japan Synthetic Rubber Co., Ltd.; and UCB-Societe Anonyme. Radiation-sensitive resin composition with admixtures of O-quinone diazide and acid esters having nitrobenzyl or cyanobenzyl group. 4,963,463, Cl. 430-191.000.
Koski, William E.: *See*—
Fan, Steve T.; and Koski, William E., 4,963,373, Cl. 426-74.000.
Kosley, Raymond W., Jr.; and Cherill, Robert J., to Hoechst-Roussel Pharmaceuticals Inc. Labdane compounds, pharmaceutical compositions and use. 4,963,537, Cl. 514-96.000.
Koster, Walter, to Schunk Motorensysteme GmbH. Grid made of electrically conducting sheet metal. 4,963,107, Cl. 439-884.000.
Kotowski, Stephan; Busse, Bernd; and Donnerhak, Bernd, to Heraeus Elektroden GmbH. Test cell for identifying deactivated surface areas of an electrode. 4,963,244, Cl. 204-400.000.
Kotraba, Norman L.: *See*—
Bishop, Norman G.; Bottinelli, N. Edward; and Kotraba, Norman L., 4,963,182, Cl. 75-590.000.
Kowalczyk, Karen B.; Arnold, David; Castonguay, Roger N.; and Yu, Yuet-Ying, to General Electric Company. Compact current limiting circuit breaker. 4,963,849, Cl. 335-201.000.
Koyama, Keiji: *See*—
Uchida, Yasuzo; Nagasaki, Hitoshi; Yamamoto, Goro; and Koyama, Keiji, 4,963,370, Cl. 426-7.000.
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Takebayashi, Hiroaki; Yamauchi, Kouichi; and Naruse, Koji, 4,963,040, Cl. 384-492.000.
Kozaki, Takahiko: *See*—
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Kozuka, Yoshinari: *See*—
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Krantz, Ingemar, to Saab Missiles Aktiebolag. Protection device for sensor means. 4,963,734, Cl. 250-239.000.
Kranz, Curt: *See*—
Anapliotis, Emanuel; Kranz, Curt; and Ploetz, Wiebke, 4,963,154, Cl. 623-22.000.
Krapcho, John, to E. R. Squibb & Sons, Inc. Process for resolving chiral intermediates used in making calcium channel blockers. 4,963,671, Cl. 540-491.000.
Krauter, Allan I., to Welch Allyn, Inc. Hydraulic muscle pump. 4,962,751, Cl. 128-4.000.
Krcova, Zuzana: *See*—
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Kress, Hans-Jurgen: *See*—
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Krishnamurthy, Ramachandran; Malik, Virginia A.; and Stokley, Alan G., to BOC Group, Inc., The. Hydrogen and carbon dioxide coproduction. 4,963,339, Cl. 423-437.000.
Krishnan, Sivaram; Keegan, Richard E.; Nodelman, Neil H.; and Lundy, Charles E., to Mobay Corporation. Gamma radiation resistant polycarbonate compositions. 4,963,598, Cl. 523-137.000.
Kristiansen, Odd: *See*—
Boger, Manfred; Drabek, Jozef; Ehrenfreund, Josef; and Kristiansen, Odd, 4,963,550, Cl. 514-249.000.
Krivi, Gwen G.: *See*—
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Kruegle, Herman A.; and Sandin, Walter T., to Visual Methods, Inc. Optical surveillance assembly and camera. 4,963,962, Cl. 358-108.000.
Krug, Thomas: *See*—
Heinz, Jochen; Krug, Thomas; Rubsam, Klemens; Kessler, Hans; and Kleyer, Siegfried, 4,962,725, Cl. 118-718.000.
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Kubik, Klaus; and Kuesters, Karl-Heinz, to Eduard Kusters Maschinenfabrik GmbH & Co. KG. Work roll with improved support and lubricating system for an hydraulically supported roll. 4,962,577, Cl. 29-116.200.
Kubo, Seitoku: *See*—
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Sampei, Keiichi; Dei, Yosihito; Furukawa, Kazuo; Fukumoto, Katsumi; and Kato, Yoshihiro, 4,962,636, Cl. 56-17.100.
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Kawase, Mitsuru; Tanimura, Masashi; Terasawa, Hidekazu; Nakamura, Sohei; Nagano, Takayuki; Higashimori, Shosuke; Matsuki, Hiroshi; and Matsumoto, Hisashi, 4,963,230, Cl. 162-129.000.

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Kurita, Tohru: *See*—
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D'Heureuse, Walter; Kusch, Hans-Jurgen; Heppenstiel, Gerhard; and Stellberger, Rudi, 4,962,705, Cl. 101-148.000.

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Kunimune, Koutchi; and Kutsuzawa, Yoshiya, 4,963,635, Cl. 528-26.000.

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KWC AG: *See*—
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Prus, Eric; and Lacchia, Adrien, 4,962,724, Cl. 118-688.000.

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Melton, Eugene R., Jr., 4,962,929, Cl. 273-29.00R.

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Lacruche, Bernard: *See*—
Cathignol, Dominique; Lacruche, Bernard; and Mestas, Jean-Louis, 4,962,753, Cl. 128-24.00A.

Lafferty, John J.; Demarinis, Robert M.; and Shah, Dinubhai H., to SmithKline Beecham Corporation. Alpha-andrenergic receptor antagonists and use thereas. 4,963,547, Cl. 514-217.000.

LaFleur, Joseph R., to Solid Flue Chimney Systems, Inc. Cementing compositions. 4,963,191, Cl. 106-698.000.

Lafon, Louis, to Laboratoire L. Lafon. 1-(acetylaminophenyl)-2-aminopropanone derivatives and pharmaceutical compositions thereof. 4,963,570, Cl. 514-331.000.

Laing, John R.; Chang, Hui; Manca, Richard D.; and Barbetta, Angelo J., to Xerox Corporation. Developer compositions with suspension polymerized styrene butadiene resins. 4,963,455, Cl. 430-106.600.

La Mantia, Francesco P.: *See*—
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Landau, Steven D.; and Hinnenkamp, James A., to Quantum Chemical Corporation. Silanated metal-pillared interlayered clay. 4,963,518, Cl. 502-62.000.

Landis, William R.; and Bradford, Peter, to Honeywell Inc. Method for detecting missing circuit board components. 4,963,752, Cl. 250-459.100.

Landrum, Joseph C. Apparatus for opening and closing tent zippers. 4,962,782, Cl. 135-119.000.

Lane, Robert, to Hollingsworth (U.K.) Ltd. Multi-position open-end spinning machine. 4,962,638, Cl. 57-301.000.

Lane, Robert. Bus side light system. 4,964,022, Cl. 362-80.000.

Lang, Richard A., to Explore Technology, Inc. Audio/video transceiver apparatus including compression means. 4,963,995, Cl. 358-335.000.

Langen, Hans: *See*—
Matejec, Reinhart; Buscher, Ralf; and Langen, Hans, 4,963,465, Cl. 430-506.000.

Langen, Peter: *See*—
Matthes, Eckart; Lehmann, Christine; Scholz, Dieter; von Janta-Lipinski, Martin; Gaertner, Klaus; Langen, Peter; and Rosenthal, Hans-Alfred, 4,963,662, Cl. 536-23.000.

Langenskiold, Tord K. W.: *See*—
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Chapin, J. Thomas; Hardee, Addison G., Jr.; Larseon-Moss, Lisa M.; Leshe, Charles M.; Overton, Bob J.; Shea, John W.; Taylor, Carl R.; and Turnipseed, John M., 4,962,992, Cl. 350-96.230.

Larwin, Renee M. Z.; Keen, Richard D., Jr.; and Zeno, Joseph R., to American Coupler Systems, Inc. Coupler assembly between a prime mover and a work implement. 4,963,071, Cl. 414-723.000.

Lasner, Jeffrey; and Lasner, Michael. Vibratory device for releasing air bubbles trapped in the heart muscle. 4,962,758, Cl. 128-41.000.

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Lasner, Jeffrey; and Lasner, Michael, 4,962,758, Cl. 128-41.000.

Lassahn, Gordon D.: *See*—
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Lassiter, Donnie A., to Pitt County Memorial Hospital. Patient support structure for performing defecography studies. 4,964,153, Cl. 378-208.000.

Lau, Felix P.: *See*—
Chernega, John G.; Martens, John A.; Lau, Felix P.; and Milner, Leslie M., 4,963,209, Cl. 156-160.000.

Laurent, Daniel, to Compagnie Generale des Etablissements Michelin. Method and apparatus of manufacturing a tire by the laying of rubber products onto a firm support. 4,963,207, Cl. 156-117.000.

Laurent, Michel; Noualhagnet, Pierre; and Mathieu, Claude, to General Electric CGR SA. Rotating anode X-ray tube comprising anodic current flow device. 4,964,147, Cl. 378-125.000.

Laurent, Yves: *See*—
Marchand, Roger; Antoine, Philippe; L'Haridon, Paul; and Laurent, Yves, 4,964,016, Cl. 361-321.000.

Laurion, Francis R.: *See*—
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Lawrence, Peter D.: *See*—
Grodski, Juliusz J.; Immega, Guy B.; and Lawrence, Peter D., 4,964,061, Cl. 364-513.000.

Layden, Lawrence M., to BOC Group, Inc., The. Apparatus for removing small particles from a substrate. 4,962,891, Cl. 239-597.000.

Lazenby, William E.: *See*—
Ranjan, Radhakrishnan; and Lazenby, William E., 4,963,850, Cl. 337-246.000.

Lazzeri, Mark A.; Hori, Roy Y.; and Harris, James C., to Zimmer, Inc. Attachment mechanism for modular surgical products. 4,963,155, Cl. 623-23.000.

Le Roux, Olivier: *See*—
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Lebeau, Donald R.; and Kalutkiewicz, Paul J., to Itek Graphix Corp. System for electronically controlling LED-array image printer. 4,963,894, Cl. 346-107.00R.

Lebleboojian, Gerald: *See*—
Cooper, David M.; and Lebleboojian, Gerald, 4,963,945, Cl. 455-307.000.

Lee, Chun Mao. Portable camera support assembly. 4,963,904, Cl. 354-82.000.

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Geyer, Joel Erwin; Lee, Joseph K.; and Wilson, Kenneth T., 4,964,113, Cl. 370-85.500.

Lee, Jung Kwan, to SKC Limited. Video tape cassette. 4,962,898, Cl. 242-199.000.

Lee, Noel. Electrical pin with bend. 4,963,101, Cl. 439-266.000.

Leech, Everett A.: *See*—
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Leffel, H. Pat. Marine signal flag. 4,962,720, Cl. 116-173.000.

LeGrange, Jane D., to AT&T Bell Laboratories. Protective coatings for optical devices comprising Langmuir-Blodgett films. 4,962,985, Cl. 350-96.150.

Lehman-Lamer, Gail R., to Tektronix, Inc. Method of fabricating a contact device. 4,963,225, Cl. 156-630.000.

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Lehmann, Volker: *See*—
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Lennon, Donald J.; and Foster, Paul B., to Hygeia Sciences, Inc. Swab expressor immunoassay device. 4,963,325, Cl. 422-61.000.

Lenoir, Raymond: *See*—
Calvignac, Jean; Dauphin, Michel; Lenoir, Raymond; and Picard, Jean-Louis, 4,964,127, Cl. 371-37.100.

Lentino, Lynn E.; and Turner, Terry L., to Black & Decker, Inc. Brush holder for an electric motor. 4,963,779, Cl. 310-71.000.

Lenz, Helmut: *See*—
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Leonti, Sergio; and Garro, Lorenzo, to Fiat Auto S.p.A. McPherson-type motor-vehicle suspension. 4,963,759, Cl. 280-691.000.

Leotard, Robert L.: *See*—
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White, Raymond L.; Nakamura, Yusuke; O'Connell, Peter; and Leppert, Mark F., 4,963,663, Cl. 536-27.000.

Lerch, L. Bernard: *See*—
Okarma, Thomas B.; Clark, Brian R.; Lerch, L. Bernard; and Chang, Chin-Hai, 4,963,265, Cl. 210-638.000.

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Chapin, J. Thomas; Hardee, Addison G., Jr.; Larseon-Moss, Lisa M.; Lesbe, Charles M.; Overton, Bob J.; Shea, John W.; Taylor, Carl R.; and Turnipseed, John M., 4,962,992, Cl. 350-96.230.

Lesher, George Y.; Bacon, Edward R.; Singh, Baldev; and Kuo, Gee-Hong, to Sterling Drug Inc. Imidazopyridines, their preparation and use. 4,963,561, Cl. 514-303.000.

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Levine, Mark P.: *See*—
Helmke, Richard W.; Smith, David C.; and Levine, Mark P., 4,962,556, Cl. 14-2.400.

Levine, Michael R. VCR programmer. 4,963,994, Cl. 358-335.000.

Levine, Robert A.; and Croke, William M., to Atlantic Richfield Company. Liquid level sensing switch actuator. 4,962,661, Cl. 73-1.00H.

Lewis, Christopher; Gartzke, Donald G.; and Scannelli, Anthony R., to Dynawave Incorporated. Electrical connector assembly. 4,963,105, Cl. 439-578.000.

Lewis, Everett C.; and Grant, Harley A., to Combustion Engineering, Inc. Method of chromizing large size articles. 4,963,395, Cl. 427-253.000.

Lex Computer and Management Corporation: *See*—
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Leybold Aktiengesellschaft: *See*—
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Heinz, Jochen; Krug, Thomas; Rubsam, Klemens; Kessler, Hans; and Kleyer, Siegfried, 4,962,725, Cl. 118-718.000.

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L'Haridon, Paul: *See*—
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Li, Shu-Tung, to Colla-Tec Incorporated. Multi-layered, semi-permeable conduit for nerve regeneration. 4,963,146, Cl. 606-152.000.

Liang, Eric: *See*—
Perr, Julius P.; Liang, Eric; Yu, Robert C.; and Ghuman, Amarjit S., 4,962,743, Cl. 123-496.000.

Liaw, Hang M.; and Seelbach, Christian A., to Motorola Inc. Selective deposition of amorphous and polycrystalline silicon. 4,963,506, Cl. 437-101.000.

Liefde, Yvan V.; de Vuyst, Marcel; and Goetsches, Peter, to W. Schlafhorst & Co. Apparatus for sensing a characteristic of a traveling yarn. 4,963,757, Cl. 250-571.000.

Lilly Industries Limited: *See*—
Baker, Stephen R.; Jamieson, William B., deceased; and Todd, Alec, 4,963,578, Cl. 514-381.000.
Hotten, Terrence M.; Timms, Graham H.; and Tupper, David E., 4,963,558, Cl. 514-293.000.

Limoni, Alfredo, to Simonazzi A. & L. S.p.A. Apparatus for converting a multi-row stream of upright articles, in particular bottles, to a single row. 4,962,842, Cl. 198-443.000.

Lin, Chien-Hung. Stabilizer bar unit the torsion to the wheels of which is capable of being automatically adjusted. 4,962,943, Cl. 280-707.000.

Lin, Jonathan K., to Alliance Telecommunications Corp. Double skirt omnidirectional dipole antenna. 4,963,879, Cl. 343-792.000.

Lin, Kon-Mang: *See*—
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Lindauer Dornier Gesellschaft m.b.H.: *See*—
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Linden, Inge-Britt Y.: *See*—
Backstrom, Reijo J.; Heinola, Kalevi E.; Honkanen, Erkki J.; Kaakkola, Seppo K.; Kairisalo, Pekka J.; Linden, Inge-Britt Y.; Mannisto, Pekka T.; Nissinen, Erkki A. O.; Pohto, Pentti; Pippuri, Aino K.; and Pystynen, Jarmo J., 4,963,590, Cl. 514-678.000.

Lindert, Andreas; Pierce, John R.; McCormick, David R.; and Zimmermann, William D., to Henkel Corporation. Treatment and after-treatment of metal with carbohydrate-modified polyphenol compounds. 4,963,596, Cl. 526-313.000.

Lindner, Christian: *See*—
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Lindquist, Thomas R.; and Bambacigno, Ralph, to Convault, Inc. Apparatus for entombment of tanks in concrete. 4,963,082, Cl. 425-117.000.

Lindroth, Thomas A.: *See*—
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Lindsay, Richard O.: *See*—
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Ling, William, to Aspex Limited. Recording and reproduction of images. 4,963,015, Cl. 352-57.000.

Lingle, Thomas M.: *See*—
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Lipeles, Russell A.; and Coleman, Dianne J., to Aerospace Corporation, The. Metallo-organic solution deposition (MOSD) of transparent, crystalline ferroelectric films. 4,963,390, Cl. 427-110.000.

Liposome Company, Inc., The: *See*—
Madden, Thomas D., 4,963,297, Cl. 264-4.300.

Liquid Air Corporation: *See*—
Hubert, Jean-Luc, 4,963,205, Cl. 156-80.000.

Lisnyansky, Khaim; and Walbaum, H. Heinz, to International Paper Company. System and method for continuous measurement of pulp consistency in a blowline of a continuous pulp digester. 4,963,229, Cl. 162-49.000.

Liss, Theodor A.; and Beck, Leonard H., to Du Pont de Nemours, E. I., and Company. Stain resistant polymers and textiles. 4,963,409, Cl. 428-96.000.

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Matsushita Electric Industrial Co., Ltd.: *See*—
Honjo, Masahiro, 4,963,991, Cl. 358-310.000.
Ishihara, Hideshi, 4,963,927, Cl. 355-207.000.
Kitaura, Hiromu; Isobe, Mitsuo; Ninomiya, Yuichi; Ohtsuka, Yoshimichi; and Izumi, Yoshinori, 4,963,969, Cl. 358-174.000.
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Matsuzawa, Akira; and Yamada, Haruyasu, 4,963,874, Cl. 341-159.000.
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Satoh, Isao; Ichinose, Makoto; Fukushima, Yoshihisa; Kuroki, Yuzuru; Takagi, Yuji; and Azumatani, Yasushi, 4,964,094, Cl. 369-59.000.
Satomi, Mitsuo; and Kaminaka, Nobuyuki, 4,964,007, Cl. 360-125.000.
Sumihara, Masanori; Imasaka, Yoshinobu; and Yoneno, Hiroshi, 4,963,781, Cl. 310-323.000.
Tajima, Akio; and Ishii, Katsumi, 4,964,115, Cl. 374-109.000.

Matsushita Electric Works, Ltd.: *See*—
Kunizawa, Hiroharu; Ueji, Noboru; Yamamura, Akira; and Itoyama, Hiroshi, 4,964,167, Cl. 381-52.000.
Matsuo, Masayuki; Abiko, Toshio; Ueno, Yoshiaki; and Kanda, Minoru, 4,963,892, Cl. 343-700.0MS.

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Matsuura, Masami: *See*—
Matsuzawa, Soichiro; Kozuka, Yoshinari; Toyoda, Shuhei; Kawaguchi, Shogo; and Matsuura, Masami, 4,962,990, Cl. 350-96.200.

Matsuura, Naoko: *See*—
Ushio, Jiro; Miyazawa, Osamu; Tomizawa, Akira; Yokono, Hitoshi; Kanda, Naoya; Matsuura, Naoko; Ando, Setsuo; and Okudaira, Hiroaki, 4,963,974, Cl. 357-80.000.

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Mattes, Ralf; Lenz, Helmut; and Stock, Werner, to Boehringer Mannheim GmbH. Enzymatically inactive, immunologically-active β-galactosidase muetin, process for making and uses thereof. 4,963,469, Cl. 435-7.000.

Matthes, Eckart; Lehmann, Christine; Scholz, Dieter; von Janta-Lipinski, Martin; Gaertner, Klaus; Langen, Peter; and Rosenthal, Hans-Alfred, to Akademie der Wissenschaften der DDR. Fluorinated nucleosides and method for treating retrovirus infections therewith. 4,963,662, Cl. 536-23.000.

Matthys, Robert J., to Gas Research Institute. Method and apparatus for providing accurate low noise demodulation. 4,963,744, Cl. 250-343.000.

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Maufe, Barry G., to Thorn EM plc. Apparatus for marking a recorded signal. 4,963,998, Cl. 360-60.000.

Maurer, Helmut: *See*—
Brand, Gunter; Brammer, Hartmut; Gerber, Richard; Glockler, Otto; Grimm, Gerold; Gruber, Hans-Ulrich; Gunther, Dieter; Issler, Jorg; Kalippke, Harald; Lolhoffel, Wolfgang; Maurer, Helmut; Mayer, Ulrich; Plapp, Gunther; Renninger, Erhard; Ruppmann, Claus; Sailer, Harald; and Werner, Peter, 4,962,737, Cl. 123-339.000.

Maus, Karl-Heinz: *See*—
Lonne, Klaus; Majewski, Klaus-Peter; Maus, Karl-Heinz; and Giesen, Franz-Josef, 4,962,939, Cl. 277-235.00B.

Maxson, Wayne S.; Hargrove, Joel T.; and Meyers, Philip G. Method for treatment of premenstrual syndrome. 4,963,540, Cl. 514-177.000.

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Buntain, Ian G.; Hatton, Leslie R.; Hawkins, David W.; Pearson, Christopher J.; and Roberts, David A., 4,963,575, Cl. 514-359.000.

May, Carl D.: *See*—
Ferrara, Randy; May, Carl D.; and Dow, Ian J., 4,962,955, Cl. 292-216.000.

May, Wolfgang, to Dragerwerk Aktiengesellschaft. Colorimetric dosimeter. 4,963,324, Cl. 422-60.000.

Mayer, Ernest J.: *See*—
Bell, Leslie D.; Mayer, Ernest J.; Palmier, Mark O.; Tolunay, H. Eser; Warren, Thomas G.; and Wun, Tze-Chein, 4,963,357, Cl. 424-94.640.

Mayer, Johann: *See*—
Schmidt-Hellerau, Christof; and Mayer, Johann, 4,963,599, Cl. 523-211.000.

Mayer, Michael A.; Mason, Lucien L.; Olson, Leonard C.; and Riemer, Keith H., to Consolidated Papers, Inc. Paper coating system and method. 4,963,397, Cl. 427-356.000.

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Kinder, David H.; and Ames, Matthew M., 4,963,655, Cl. 530-331.000.

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Boppart, Loren P., 4,963,066, Cl. 414-376.000.

Mayweather III, William T.; and Nutter, Robert F., to RCA Licensing Corporation. Apparatus for computing interpolation weighting factor for time compression or expansion. 4,963,964, Cl. 358-134.000.

Mazda Motor Corporation: *See*—
Ito, Keizo; and Shoda, Mitsuyuki, 4,962,961, Cl. 296-192.000.
Yukitomo, Kazuo, 4,963,856, Cl. 340-426.000.

McAdam, Peter L.; Schnerk, Thomas G.; and Shreve, Gregory A., to TRW Inc. Secure television signal encoding and decoding system. 4,964,162, Cl. 380-14.000.

McBroom, James P.: *See*—
Appal, Eugene R.; Beiser, Michael A.; and McBroom, James P., 4,962,864, Cl. 220-270.000.

McCarthy, Kevin; and DeBourke, Patrick, to Grove Telecommunications Ltd. Fish sorting machine. 4,963,035, Cl. 382-28.000.

McCarthy, Michael C., to TRW, Inc. Ultrasonic fluid level sensor. 4,964,090, Cl. 367-162.000.

McCormick, David R.: *See*—
Lindert, Andreas; Pierce, John R.; McCormick, David R.; and Zimmermann, William D., 4,963,596, Cl. 526-313.000.

McCormick, William S.: *See*—
Tsui, James B. Y.; and McCormick, William S., 4,963,816, Cl. 324-77.00H.

McCurdy, Kal B. Brake system for a wheelbarrow. 4,962,833, Cl. 188-2.00R.

McDermott, Kevin. Synthesized lighting device. 4,963,798, Cl. 315-312.000.

McDonnell Douglas Corporation: *See*—
Blackmon, James B.; and Edwards, Don, 4,963,025, Cl. 356-376.000.

McGonigle, Sylvia S.: *See*—
Blain, David A.; Cardis, Angeline B.; and McGonigle, Sylvia S., 4,963,278, Cl. 252-51.50A.
McGranaghan, Mark F.: *See*—
Grassel, Wayne E.; and McGranaghan, Mark F., 4,964,055, Cl. 364-485.000.
McGuire, Daniel J.: *See*—
Miley, Guy M.; and McGuire, Daniel J., 4,963,072, Cl. 414-797.600.
McKeown, Stephen A.: *See*—
LeVasseur, Robert D.; and McKeown, Stephen A., 4,963,414, Cl. 428-195.000.
McKinney, James C.: *See*—
Schuckmann, Alfred Von; and McKinney, James C., 4,962,851, Cl. 222-209.000.
McMahon, Maurice T.: *See*—
Hsieh, Edward P.; McMahon, Maurice T.; and Schnurmann, Henri D., 4,963,824, Cl. 324-158.00R.
McMaster, Richard L., to Detection Systems, Inc. Quad element intrusion detection. 4,963,749, Cl. 250-349.000.
McMullin, John C., to Molectron Detector, Inc. Large area pyroelectric joulemeter. 4,963,741, Cl. 250-338.300.
McNeil-PPC, Inc.: *See*—
Dabroski, Winifred C., 4,963,139, Cl. 604-378.000.
McNeilus Truck and Manufacturing, Inc.: *See*—
Strehlow, Robert W., 4,963,032, Cl. 366-57.000.
MDS Health Group Limited: *See*—
Douglas, Donald J.; and French, John B., 4,963,736, Cl. 250-292.000.
Mead Corporation, The: *See*—
Beery, Jack; and Boyer, David A., 4,963,459, Cl. 430-138.000.
Mead, Maurice J.: *See*—
Gooding, Chester W., Jr.; and Mead, Maurice J., 4,963,406, Cl. 428-43.000.
Measor, Grahame, to ANT Nachrichtentechnik GmbH. DS3 - line interface linear array (lila). 4,964,116, Cl. 375-11.000.
Mechanical Tool & Engineering Co.: *See*—
Maney, Jeffrey H., 4,962,832, Cl. 187-110.000.
Mechesney, Veronica A. Book cover and note keeper system. 4,962,951, Cl. 283-114.000.
Mecron medizinische Produkte GmbH: *See*—
Anapliotis, Emanuel; Kranz, Curt; and Ploetz, Wiebke, 4,963,154, Cl. 623-22.000.
Mect Corporation: *See*—
Nagai, Yoshitaka; Shibayama, Shohei; Numata, Masaaki; Yoshimura, Shoji; Tanaka, Makoto; Ito, Masayoshi; Awaya, Akira; Kobayashi, Hisashi; Abe, Hayao; Ishizuka, Yusaku; and Ogawa, Tomoya, 4,963,653, Cl. 530-322.000.
Medaphore, Inc.: *See*—
Ecanow, Bernard, 4,963,367, Cl. 424-485.000.
Medlin, Roger E., to ABB Power T & D Company. Energy meter. 4,963,820, Cl. 324-142.000.
Meffert, Alfred: *See*—
Beaujean, Hans-Josef; Eisenblaetter, Horst; Fues, Johann F.; Giesen, Brigitte; Holz, Erich; Jahnke, Ulrich; Kuenzel, Werner; Meffert, Alfred; Schwadtke, Karl; Smulders, Eduard; Sung, Eric; Syldatk, Andreas; Toelken, Hans-Georg; and Wegener, Ingo, 4,963,158, Cl. 8-137.000.
Mehrgardt, Soenke; and Winterer, Martin, to Deutsche ITT Industries GmbH. Harvard architecture microprocessor with arithmetic operations and control tasks for data transfer handled simultaneously. 4,964,046, Cl. 364-200.000.
Meicor, Inc.: *See*—
Klostermann, Heinrich F.; and Braun, Martin, 4,964,148, Cl. 378-127.000.
Meier, Kurt; Haug, Theobald; and Scharf, Wolfgang, to Ciba-Geigy Corporation. Process for the preparation of laminates. 4,963,300, Cl. 264-22.000.
Meiji Seika Kaisha Co., Ltd.: *See*—
Sato, Akira; Sato, Toshio; and Yamanoi, Kiyoshi, 4,963,375, Cl. 426-233.000.
Meisner & Wurst GmbH & Co.: *See*—
Wurst, Manfred P.; Simon, Rudolf; and Kahlden, Thomas V., 4,963,069, Cl. 414-416.000.
Mele, Sam. Adjustable depth thermocouple system and fitting. 4,963,194, Cl. 136-221.000.
Melquist, John L.: *See*—
Fenoglio, David J.; Fjare, Douglas E.; and Melquist, John L., 4,963,648, Cl. 528-350.000.
Melton, Eugene R., Jr., to Lacer, Inc. Wrist strap for attracting an item of sports equipment to the wrist. 4,962,929, Cl. 273-29.00R.
Membrane Technology & Research, Inc.: *See*—
Blume, Ingo; and Pinnau, Ingo, 4,963,165, Cl. 55-16.000.
Meng, Yeong-Ming. Multi-function umbrella. 4,962,779, Cl. 135-16.000.
Merck & Co., Inc.: *See*—
Alexander, Jose; Fix, Joseph A.; and Repta, A. J., 4,963,525, Cl. 514-11.000.
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Allen, Floyd L.; Best, Glen H.; and Lindroth, Thomas A., 4,963,668, Cl. 536-114.000.
Calabria, Ralph; Hartner, Frederick W.; and Sisko, John T., 4,963,534, Cl. 514-54.000.
Chiu, Shuet-Hing L.; Carlin, Josephine R.; and Taub, Rae, 4,963,667, Cl. 536-7.100.
Currie, Sara A.; Miller, Thomas W.; Dulaney, Eugene L.; Springer, James P.; Valiant, Mary E.; Mochales del Val, Sagrario; and Zimmerman, Sheldon B., 4,963,569, Cl. 514-326.000.
Duggan, Mark E.; and Hartman, George D., 4,963,538, Cl. 514-99.000.
Ellis, Ronald W.; Hagopian, Arpi; Kniskern, Peter J.; and Montgomery, Donna L., 4,963,483, Cl. 435-69.300.
Zambias, Robert A.; and Hammond, Milton L., 4,963,580, Cl. 514-443.000.
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Gatz, Christiane; Altschmied, Joachim; Gassen, Hans G.; and Hillen, Wolfgang, 4,963,488, Cl. 435-233.000.
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Mesa, Inc.: *See*—
Jones, Robert W., 4,962,760, Cl. 128-80.00F.
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Bochmann, Klaus; Risto, Hans-Joachim; Volker, Wolfgang; Gursky, Helmut; and Steidl, Dieter, 4,962,893, Cl. 241-5.000.
Messing, Dean: *See*—
Luthra, Ajay K.; and Messing, Dean, 4,963,020, Cl. 356-73.100.
Mestas, Jean-Louis: *See*—
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Metheringham, Nigel: *See*—
Bugg, Richard E. F.; and Metheringham, Nigel, 4,963,968, Cl. 358-147.000.
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Knowles, Carl H., 4,962,980, Cl. 350-6.600.
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Chavez, Rodrigo G.; David, Harold; Metzner, Ernest K.; Sigler, Gerald F.; and Winn-Deen, Emily S., 4,963,479, Cl. 435-22.000.
Meyer, George Y., Jr.: *See*—
Ashley, Walter L., Jr.; Jansen, Daniel F.; and Meyer, George Y., Jr., 4,962,587, Cl. 29-894.350.
Meyer, Michael D.: *See*—
Schoenleber, Robert W.; Kebabian, John W.; Martin, Yvonne C.; DeNinno, Michael P.; Perner, Richard J.; Stout, David M.; Hsiao, Chi-Nung W.; DiDomenico, Stanley, Jr.; DeBernardis, John F.; Basha, Fatima Z.; Meyer, Michael D.; and De, Biswanath, 4,963,568, Cl. 514-320.000.
Meyer, Robert A., to Ramvac Corp. Vacuum controller and filter assembly for dental vacuum system. 4,963,094, Cl. 433-95.000.
Meyering, Ralph A. Person powered vehicle automatic transmission. 4,963,120, Cl. 474-69.000.
Meyers, Philip G.: *See*—
Maxson, Wayne S.; Hargrove, Joel T.; and Meyers, Philip G., 4,963,540, Cl. 514-177.000.
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Bressan, Joelle; and Mezon, Jacques, 4,963,290, Cl. 252-387.000.
Mian, Aziz A.: *See*—
Allen, Steven R.; Mian, Aziz A.; and Samuels, Sam L., 4,963,298, Cl. 264-12.000.
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Lapham, David J.; and Troughton, Nicholas A., 4,963,283, Cl. 252-79.300.
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Locascio, James J., 4,964,026, Cl. 363-39.000.
Microptronics S.r.l.: *See*—
Checchetti, Maurizio, 4,963,726, Cl. 250-208.100.
Midgley, John A.: *See*—
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Mielke, Neal R., to Intel Corporation. Method of screening EPROM-related devices for endurance failure. 4,963,825, Cl. 324-158.00R.
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Mikoshiba, Atsushi: *See*—
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Milani, Federico: *See*—
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Millard, Lance L. Portable electronic insect controller. 4,962,611, Cl. 43-112.000.
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Miller, Michael K.; and Stockton, Warren D. Large capacity ammunition magazine. 4,962,604, Cl. 42-49.010.
Miller, Richard A.: *See*—
Pavlik, Norman M.; Sefko, John; and Miller, Richard A., 4,963,199, Cl. 148-307.000.
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Mills, Brian P.: *See*—
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Minagawa, Yoshiji; Shirakawa, Hiroshi; Yamazaki, Hiroshi; and Ito, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Load control system and method for disconnecting sub-bus from main-bus. 4,963,763, Cl. 307-35.000.
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Watanabe, Atsuo; Yazawa, Yoshiaki; Hiraishi, Atsushi; Minami, Masataka; Nagano, Takahiro; Ikeda, Takahide; and Momma, Naohiro, 4,963,973, Cl. 357-42.000.
Minamida, Isao: *See*—
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Minamimure, Mamoru: *See*—
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Miner, Gary E.: *See*—
Cogan, George W.; Miner, Gary E.; Christel, Lee A.; and Gibbons, James F., 4,963,500, Cl. 437-8.000.
Miner, Lewis B., to Napoleon, Walter K.; and Miner, Lewis B. Threaded removable end mount system for shock absorbers. 4,962,834, Cl. 188-321.110.
Ming-Tang, Chen. Workbench with its devices. 4,962,799, Cl. 144-286.00A.
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Minielli, Joseph L.: *See*—
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Ichimura, Kunihiro; Suzuki, Yasuzo; Seki, Takahiro; Sakuragi, Masako; Tamaki, Takashi; Hosoki, Akira; and Aoki, Koso, 4,963,448, Cl. 430-20.000.
Minnesota Mining and Manufacturing Company: *See*—
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Carlson, James G.; and Yarian, Dean R., 4,963,415, Cl. 428-199.000.
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Olsen, Arnold T.; and Young, John S., 4,963,700, Cl. 174-138.00F.
Wong, Chiu P., 4,963,402, Cl. 428-1.000.
Yamashita, Shunsuke; and Kondoh, Norihito, 4,963,405, Cl. 428-40.000.
Minnick, Jim. Golf glove. 4,962,547, Cl. 2-161.00A.
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Hotomi, Hideo, 4,962,723, Cl. 118-654.000.
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Inoue, Manabu; Taniguchi, Nobuyuki; Hata, Yoshiaki; Hoda, Takeo; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,963,907, Cl. 354-222.000.
Ishimura, Toshihiko, 4,963,910, Cl. 354-400.000.
Kawabuchi, Yoichi, 4,963,935, Cl. 355-245.000.
Kusano, Hideaki; and Ito, Masaaki, 4,963,923, Cl. 355-68.000.
Maruta, Syuzi; Ito, Masazumi; and Ohira, Tadashi, 4,963,946, Cl. 355-308.000.
Matsui, Toru; and Ueda, Hiroshi, 4,963,911, Cl. 354-403.000.
Murasaki, Sadanobu; and Takei, Hajime, 4,963,896, Cl. 346-134.000.
Tanaka, Yoshihiro; Tsuji, Sadafusa; Hata, Yoshiaki; Inoue, Manabu; Ootsuka, Hiroshi; Iwata, Michihiro; Ishito, Fumiaki; and Hayama, Koh, 4,963,916, Cl. 354-435.000.
Tange, Keigo, 4,963,944, Cl. 355-298.000.
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Tsuji, Kenji; Omaki, Takanobu; and Makai, Masaaki, 4,963,914, Cl. 354-413.000.
Taniguchi, Nobuyuki; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; Hoda, Takeo; and Ueda, Hiroshi, 4,963,917, Cl. 354-484.000.
Ueda, Masahide; and Tokumoto, Masao, 4,963,929, Cl. 355-215.000.
Mirabelli, Christopher K.: *See*—
Badger, Alison M.; Cheeseman, Elaine N.; DiMartino, Michael J.; Dorman, James W.; Mirabelli, Christopher K.; Picker, Donald H.; and Schwartz, David A., 4,963,557, Cl. 514-278.000.
Misawa, Akira: *See*—
Shin, Masaaki; Hirayama, Nobuhiro; Ishikawa, Keiichi; and Misawa, Akira, 4,963,456, Cl. 430-109.000.
Mischenko, Nicholas; and Nagele, Albert L., to Motorola, Inc. Battery charger housing for batteries of differing dimensions. 4,963,812, Cl. 320-2.000.
Mischke, Peter: *See*—
Mrotzeck, Uwe; Mischke, Peter; Schwaiger, Gunther; Russ, Werner; and Sittig, Manfred, 4,963,660, Cl. 534-618.000.
Mishiba, Saburo: *See*—
Toyoda, Yasushi; and Mishiba, Saburo, 4,963,613, Cl. 524-594.000.
Mita Industrial Co., Ltd.: *See*—
Kurando, Shigeo; Makiura, Yoshinori; Shigemura, Yutaka; Ooura, Junichi; Mifune, Eiji; Imafuku, Tatsuo; Komata, Hiroshi; and Ido, Mikio, 4,963,939, Cl. 355-260.000.
Onishi, Kunihiro; Takada, Akihiro; and Sakamoto, Kaneyuki, 4,963,926, Cl. 355-203.000.
Yano, Koji; Miyakawa, Nobuhiro; Higashiguchi, Teruaki; Yamamoto, Kazuo; and Kawakami, Yoshinobu, 4,963,454, Cl. 430-106.600.
Mita, Seiichi: *See*—
Doi, Nobukazu; Eto, Yoshizumi; Izumita, Morishi; Mita, Seiichi; and Takeshita, Kazuyuki, 4,963,992, Cl. 358-335.000.
Mitamura, Hideyuki; Arimatsu, Yoshikazu; Tani, Katsuya; and Katsuo, Kenichi, to Toyo Boseki Kabushiki Kaisha. Process for production of polyester polyurethane elastomeric fibers. 4,963,310, Cl. 264-205.000.
Mitani, Hiroaki, to Sansho Seiyaku Co., Ltd. Emulsified compositions containing elastin hydrolysate. 4,963,656, Cl. 530-353.000.
Mitani, Takeki, to Mitsubishi Denki Kabushiki Kaisha. Method of measuring atmospheric pressure for an internal combustion engine. 4,962,663, Cl. 73-115.000.
Mitel Corporation: *See*—
Pinard, Debbie, 4,964,155, Cl. 379-136.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujimoto, Takanori; and Hara, Toshiro, 4,962,740, Cl. 123-481.000.
Fujimura, Takeo, 4,963,008, Cl. 350-452.000.
Harada, Shigeru, 4,962,727, Cl. 118-723.000.
Iwata, Toshio, 4,962,738, Cl. 123-425.000.
Kajiwara, Yasuya; and Kawasaki, Keiu, 4,963,800, Cl. 318-254.000.
Kitamura, Yutaka, 4,963,776, Cl. 310-64.000.
Kobayashi, Eiji, 4,962,585, Cl. 29-885.000.
Masada, Shigeo, 4,963,723, Cl. 235-384.000.
Minagawa, Yoshiji; Shirakawa, Hiroshi; Yamazaki, Hiroshi; and Ito, Yoshiaki, 4,963,763, Cl. 307-35.000.
Mitani, Takeki, 4,962,663, Cl. 73-115.000.
Mitsui, Shigeru; Hattori, Ryo; and Yagi, Tetsuya, 4,964,135, Cl. 372-46.000.
Murano, Katsuaki; Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 4,962,678, Cl. 74-844.000.
Nakabayashi, Takeo; and Machida, Hirohisa, 4,963,862, Cl. 340-825.520.
Nishizawa, Hiroyuki; Kashiwabara, Kimito; Nako, Osamu; Ishii, Mitsuaki; Yamane, Kouichi; Miyazaki, Masaaki; and Nishiyama, Ryoji, 4,962,742, Cl. 123-492.000.
Sakai, Kunito; Tanaka, Sueyosi; Tutumi, Yasutugu; and Morita, Yutaka, 4,963,307, Cl. 264-102.000.
Sasaki, Toshihiko; and Yotsumoto, Hatsuo, 4,963,269, Cl. 210-760.000.
Sugiyama, Takeshi, 4,963,760, Cl. 290-48.000.
Takada, Mitsuyuki; Tsukao, Ryusaku; and Takasago, Hayato, 4,963,389, Cl. 427-98.000.
Togane, Hikohiro, 4,963,281, Cl. 252-62.600.
Wataya, Seiji, 4,962,739, Cl. 123-435.000.
Yokoya, Hisao, 4,963,081, Cl. 425-115.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Kuriyama, Yasuhisa; Sakaguchi, Shuuzabu; Kohzaki, Toshiaki; and Nito, Syoichi, 4,963,232, Cl. 203-29.000.
Saito, Masao; Tsukahara, Kengo; Yamada, Koichiro; and Imai, Hisasi, 4,963,687, Cl. 546-286.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Nishizawa, Hiroyuki; Kashiwabara, Kimito; Nako, Osamu; Ishii, Mitsuaki; Yamane, Kouichi; Miyazaki, Masaaki; and Nishiyama, Ryoji, 4,962,742, Cl. 123-492.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Koda, Masatoshi; and Araki, Kazuyuki, 4,963,108, Cl. 440-81.000.
Yamauchi, Yasuhiro; Arakawa, Yoshihisa; Fujima, Yukihisa; Takenaga, Kiyomasa; and Hino, Hirokazu, 4,962,711, Cl. 110-347.000.

Mitsubishi Kasei Corporation: *See*—
Aoyagi, Yoshiki; Murakami, Atsushi; Nakada, Mamoru; Ajiki, Mitsunori; and Suzuki, Shigeru, 4,963,891, Cl. 343-700.0MS.
Morita, Yoshiharu; Imaki, Naoshi; Shirasaka, Tadashi; and Shimpuku, Tetsuro, 4,963,684, Cl. 546-90.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Matsuo, Yutaka; Suda, Yoshitaka; and Suda, Nobuo, 4,963,323, Cl. 420-422.000.
Yato, Tadao; Tanaka, Hiroshi; Kikuchi, Toshiaki; and Onoshita, Toshio, 4,963,294, Cl. 252-636.000.

Mitsubishi Paper Mills, Ltd: *See*—
Matsushita, Toshihiko; Hiraishi, Shigetoshi; and Morishita, Sadao, 4,963,457, Cl. 430-138.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Ida, Kozo; and Horiuchi, Tetsuya, 4,963,624, Cl. 525-309.000.
Sato, Mitsuo; Aoki, Toshikazu; Takamatsu, Yukishige; and Ryoke, Hideyasu, 4,963,639, Cl. 528-72.000.

Mitsui, Shigeru; Hattori, Ryo; and Yagi, Tetsuya, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor laser. 4,964,135, Cl. 372-46.000.

Mitsui Toatsu Chemical, Inc.: *See*—
Nagai, Yoshitaka; Shibayama, Shohei; Numata, Masaaki; Yoshimura, Shoji; Tanaka, Makoto; Ito, Masayoshi; Awaya, Akira; Kobayashi, Hisashi; Abe, Hayao; Ishizuka, Yusaku; and Ogawa, Tomoya, 4,963,653, Cl. 530-322.000.

Mitsui Toatsu Chemicals, Incorporated: *See*—
Shin, Masaaki; Hirayama, Nobuhiro; Ishikawa, Keiichi; and Misawa, Akira, 4,963,456, Cl. 430-109.000.
Tanaka, Eishi; Nishizawa, Tsutomu; and Yamada, Yasuyuki, 4,963,449, Cl. 430-59.000.

Mitsuoka, Akio: *See*—
Hara, Shigeo; Sekine, Setsuo; Suzuki, Toshio; Taguchi, Minoru; Mitsuoka, Akio; and Tetsu, Yoshiyuki, 4,963,435, Cl. 428-379.000.

Miura, Kozo: *See*—
Otsuki, Noboru; Oonishi, Toshihiko; Tomioka, Katsumi; and Miura, Kozo, 4,962,881, Cl. 251-149.700.

Miura, Nobuhiro: *See*—
Sanuki, Masami; Itoigawa, Fumihiro; Kojima, Akikazu; Inagaki, Mitsuo; Yasuda, Masanori; Kurokawa, Yoshiki; Miyagawa, Kazuhito; Suzuki, Seiichiro; Iwanami, Shigeki; Kawasaki, Shiro; and Miura, Nobuhiro, 4,963,074, Cl. 417-222.000.

Miura, Norimasa; and Sato, Yoshihisa, to Japan Tobacco Inc. Control system for cigarette making and packaging system. 4,962,840, Cl. 198-347.100.

Miwa, Yoshiyuki; and Wada, Takashi, to Kabushiki Kaisha Toshiba. Centrifugal brewing type coffee maker. 4,962,693, Cl. 99-283.000.

Miyadai, Masao: *See*—
Takai, Ryuzo; and Miyadai, Masao, 4,963,441, Cl. 428-690.000.

Miyagawa, Kazuhito: *See*—
Sanuki, Masami; Itoigawa, Fumihiro; Kojima, Akikazu; Inagaki, Mitsuo; Yasuda, Masanori; Kurokawa, Yoshiki; Miyagawa, Kazuhito; Suzuki, Seiichiro; Iwanami, Shigeki; Kawasaki, Shiro; and Miura, Nobuhiro, 4,963,074, Cl. 417-222.000.

Miyajima, Akira, to Citizen Watch Co., Ltd. Liquid crystal display device. 4,963,001, Cl. 350-331.00R.

Miyakawa, Nobuhiro: *See*—
Yano, Koji; Miyakawa, Nobuhiro; Higashiguchi, Teruaki; Yamamoto, Kazuo; and Kawakami, Yoshinobu, 4,963,454, Cl. 430-106.600.

Miyake, Katsumi: *See*—
Aoki, Shigeo; Ugai, Yasuhiro; Miyake, Katsumi; and Okamoto, Kotaro, 4,963,503, Cl. 437-41.000.

Miyake, Katsuya, to Akebono Brake Industry Co., Ltd. Anti-skid control system for motor vehicles. 4,962,971, Cl. 303-100.000.

Miyamoto, Yutaka: *See*—
Iwata, Ritsuo; Ogata, Tomohide; Omoto, Kaneo; Nagashima, Hironao; Nakajima, Koji; and Miyamoto, Yutaka, 4,963,214, Cl. 156-276.000.

Miyasaka, Katsuyuki; and Aoyagi, Takuo, to Miyasaka, Katsuyuki; and Nihon Kohden Corporation. Apparatus for limiting a time integration value of a pulsed current. 4,964,010, Cl. 361-18.000.

Miyata, Shigeru; and Ohno, Kiyotaka, to NGK Spark Plug Co., Ltd. Mixing liquid ratio detector device. 4,962,746, Cl. 123-613.000.

Miyazaki, Hajime; Go, Shintetsu; Senoo, Akihiro; Iuchi, Kazushi; and Kanemaru, Tetsuro, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member with disazo pigment. 4,963,450, Cl. 430-59.000.

Miyazaki, Koichi, to Fuji Xerox Co., Ltd. Chroma control method. 4,963,925, Cl. 355-77.000.

Miyazaki, Masaaki: *See*—
Nishizawa, Hiroyuki; Kashiwabara, Kimito; Nako, Osamu; Ishii, Mitsuaki; Yamane, Kouichi; Miyazaki, Masaaki; and Nishiyama, Ryoji, 4,962,742, Cl. 123-492.000.

Miyazawa, Kazuo: *See*—
Matsuo, Noritaka; Taue, Jun; and Miyazawa, Kazuo, 4,962,736, Cl. 123-257.000.

Miyazawa, Kazutoshi: *See*—
Saito, Shinichi; Miyazawa, Kazutoshi; Ohno, Kouji; and Inoue, Hiromichi, 4,963,288, Cl. 252-299.610.

Miyazawa, Osamu: *See*—
Ushio, Jiro; Miyazawa, Osamu; Tomizawa, Akira; Yokono, Hitoshi; Kanda, Naoya; Matsuura, Naoko; Ando, Setsuo; and Okudaira, Hiroaki, 4,963,974, Cl. 357-80.000.

Miyoshi, Masanobu: *See*—
Kajiwara, Makoto; Miyoshi, Masanobu; Onodera, Kaoru; and Sakamoto, Eiichi, 4,963,466, Cl. 430-551.000.

Mizunuma, Tatsuya; Tamaki, Ryoichi; Kanzaki, Shoji; Tanisho, Yoshiaki; and Yamato, Fuzio, to Kao Corporation. Dispersant composition for cement. 4,963,190, Cl. 106-724.000.

Mizusawa Industrial Chemcals, Ltd.: *See*—
Okabayashi, Seiji; Watanabe, Hirofumi; Abe, Kiyoshi; and Ogawa, Masahide, 4,963,519, Cl. 502-63.000.

Mobay Corporation: *See*—
Dewhurst, John E., 4,963,640, Cl. 528-73.000.
Krishnan, Sivaram; Keegan, Richard E.; Nodelman, Neil H.; and Lundy, Charles E., 4,963,598, Cl. 523-137.000.

Mobil Oil Corporation: *See*—
Alameddine, Bassem R., 4,962,814, Cl. 166-288.000.
Audeh, Costandi A.; and Bell, Weldon K., 4,963,340, Cl. 423-444.000.
Benoit, Gordon L., 4,963,388, Cl. 427-29.000.
Blain, David A.; Cardis, Angeline B.; and McGonigle, Sylvia S., 4,963,278, Cl. 252-51.50A.
Haddad, James H.; and Owen, Hartley, 4,963,328, Cl. 422-144.000.
Shu, Paul, 4,963,597, Cl. 523-130.000.

Mochales del Val, Sagrario: *See*—
Currie, Sara A.; Miller, Thomas W.; Dulaney, Eugene L.; Springer, James P.; Valiant, Mary E.; Mochales del Val, Sagrario; and Zimmerman, Sheldon B., 4,963,569, Cl. 514-326.000.

Mochizuki, Jun: *See*—
Kawame, Keisuke; Asano, Toshio; and Mochizuki, Jun, 4,963,828, Cl. 324-404.000.

Moench, Jerry D.: *See*—
Agrawal, Om P.; Ilgenstein, Kerry A.; Wright, Michael J.; Moench, Jerry D.; and Khu, Arthur H., 4,963,768, Cl. 307-465.000.

Mohler, Jonathan H.: *See*—
Halcomb, Danny L.; and Mohler, Jonathan H., 4,963,203, Cl. 149-37.000.

Mohr, Viggo: *See*—
Hellgren, Lars G. I.; Mohr, Viggo; and Vincent, Jan G., 4,963,491, Cl. 435-264.000.

Mohtasham, Mehdi, to EJA Engineering Company Limited. Safety switch assemblies. 4,963,706, Cl. 200-334.000.

Mokrosz, Maria: *See*—
Strekowski, Lucjan; Mokrosz, Maria; and Harden, Donald B., 4,963,676, Cl. 544-237.000.

Molby, Lloyd A.: *See*—
Newman, John C.; and Molby, Lloyd A., 4,962,858, Cl. 209-44.000.

Molectron Detector, Inc.: *See*—
McMullin, John C., 4,963,741, Cl. 250-338.300.

Molecular Devices Corporation: *See*—
Hafeman, Dean, 4,963,815, Cl. 324-715.000.
Kung, Viola T.; Nagainis, Peter A.; and Sheldon, Edward L., III, 4,963,658, Cl. 530-406.000.

Moller, Johannes; Petersen, Erwin; and Rothen, Johann, to WABCO Fahrzeugbremsen GmbH. Relay-controlled valve. 4,962,690, Cl. 91-459.000.

Molnar, Julius J.; and Becker, Richard A., to Nordson Corporation. Fiber spray system. 4,963,392, Cl. 427-180.000.

Molyneux, Sydney: *See*—
Allen, Peter; and Molyneux, Sydney, 4,963,211, Cl. 156-195.000.

Momma, Naohiro: *See*—
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Mono-Lite Corporation: *See*—
Huegli, Ronald, 4,963,408, Cl. 428-71.000.

Monroe, Bruce M.: *See*—
Trout, Torence J.; Chan, Dominic M.; and Monroe, Bruce M., 4,963,471, Cl. 430-282.000.

Monsanto Company: *See*—
Bell, Leslie D.; Mayer, Ernest J.; Palmier, Mark O.; Tolunay, H. Eser; Warren, Thomas G.; and Wun, Tze-Chein, 4,963,357, Cl. 424-94.640.
Highfill, Louis A., 4,962,728, Cl. 119-3.000.

Montanari, Gerard M.: *See*—
Louis, Philippe P. R.; Montanari, Gerard M.; and Leotard, Robert L., 4,964,038, Cl. 364-200.000.

Montani, Enrico: *See*—
Roggero, Arnaldo; Pedretti, Ugo; Magagnini, Pier L.; Montani, Enrico; Hakemi, Hassan A.; Bresci, Bruno; and La Mantia, Francesco P., 4,963,642, Cl. 528-190.000.

Montgomery, Donna L.: *See*—
Ellis, Ronald W.; Hagopian, Arpi; Kniskern, Peter J.; and Montgomery, Donna L., 4,963,483, Cl. 435-69.300.

Montgomery, Donnel: *See*—
Wang, Hwa-Chi; Montgomery, Donnel; Wen, Horng-Yuan; and Kasper, Gerhard, 4,962,673, Cl. 73-864.730.

Monto, Mark. Cigarette box with interior matches. 4,962,850, Cl. 206-92.000.

Moore, Barbara A.: *See*—
Seele, Rainer; Karbach, Stefan; Kober, Reiner; Zipplies, Matthias; Sauter, Hubert; Moore, Barbara A.; Carlson, Dale R.; Zorner, Paul S.; Westphalen, Karl-Otto; and Wuerzer, Bruno, 4,963,690, Cl. 548-264.800.

Moore, Edward R.: *See*—
Mathews, Roger A.; Moore, Edward R.; and Cannell, David W., 4,963,349, Cl. 424-72.000.

Moore, Eric F. Cleansing apparatus. 4,962,560, Cl. 15-53.300.

Moore, Morris A., to Motorola, Inc. Battery saver for a TDM system. 4,964,121, Cl. 370-100.100.

Morgan, Charles R.; Chen, Cheng-Chi; Blinka, Thomas A.; and Obligin, Alan S., to W. R. Grace & Co.-Conn. Composition and process for separating fluid mixtures. 4,963,266, Cl. 210-640.000.

Morgan, Douglas R.; and Sones, Richard A., to Picker International, Inc. Split energy level radiation detection. 4,963,746, Cl. 250-363.020.

Morgan, George R., to Morgan, George R. Four cycle, external combustion, closed regenerative cycle, piston engine. 4,962,645, Cl. 60-682.000.

Morgan, Robert C.: *See*—
Aharoni, Shaul M.; and Morgan, Robert C., 4,963,311, Cl. 264-210.800.

Mori, Hidetoshi, to Tamagawa Seiki Kabushiki Kaisha. Stepping motor. 4,963,775, Cl. 310-49.00R.

Morikawa, Asao: *See*—
Kondo, Kazuo; and Morikawa, Asao, 4,963,187, Cl. 106-1.140.

Morikawa Snagyo Kabushiki Kaisha: *See*—
Kanoh, Kunihiko; Sunohara, Tadaomi; and Hayasaka, Chushiro, 4,963,213, Cl. 156-249.000.

Morishita, Sadao: *See*—
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Morita, Sejii: *See*—
Uchida, Minoru; Morita, Sejii; and Chihiro, Masatoshi, 4,963,566, Cl. 514-312.000.

Morita, Yoshiharu; Imaki, Naoshi; Shirasaka, Tadashi; and Shimpuku, Tetsuro, to Mitsubishi Kasei Corporation. Process for preparing cotarnine. 4,963,684, Cl. 546-90.000.

Morita, Yutaka: *See*—
Sakai, Kunito; Tanaka, Sueyosi; Tutumi, Yasutugu; and Morita, Yutaka, 4,963,307, Cl. 264-102.000.

Moriya, Kazunori; Takagi, Nobuyuki; Sugaya, Toshihiro; and Nakamura, Norio, to Kabushiki Kaisha Toshiba. Magnetic disk having an index area and a limited number of radially extending servo sections. 4,964,009, Cl. 360-135.000.

Moriyasu, Takashi: *See*—
Tsutsumitake, Hideyuki; Muranaga, Tetsuro; and Moriyasu, Takashi, 4,964,064, Cl. 364-513.000.

Morris, James C.: *See*—
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Morris, Ruth A.: *See*—
Eisen, Ivan R.; and Morris, Ruth A., 4,964,077, Cl. 364-900.000.

Morrone, William R.: *See*—
Zobrist, Ray H.; and Morrone, William R., 4,963,545, Cl. 514-211.000.

Morse, Dwain, to Aqua Dynamics Group Corp. Method and system for variable frequency electromagnetic water treatment. 4,963,268, Cl. 210-739.000.

Morton, Roger A., to Eastman Kodak Company. Method and apparatus for grey level printing. 4,963,989, Cl. 358-298.000.

Moskovich, Jacob, to U.S. Precision Lens, Inc. Color corrected projection lens. 4,963,007, Cl. 350-432.000.

Mostashari, Scott S., to Honeywell Inc. Method of detecting a cable fault and switching to a redundant cable in a universal local area network. 4,964,120, Cl. 370-016.000.

Motor Wheel Corporation: *See*—
Stalter, Robert J., Sr.; and Prueter, Albert H., 4,963,083, Cl. 425-125.000.

Motorola, Inc.: *See*—
Berry, Thomas G., 4,964,163, Cl. 380-23.000.
Capurka, Zbynek A., 4,964,104, Cl. 367-99.000.
Jandu, Jaswinder S.; and Smith, Trevor S., 4,964,078, Cl. 365-51.000.
Liaw, Hang M.; and Seelbach, Christian A., 4,963,506, Cl. 437-101.000.
Mischenko, Nicholas; and Nagele, Albert L., 4,963,812, Cl. 320-2.000.
Moore, Morris A., 4,964,121, Cl. 370-100.100.
Mountz, Michael C., 4,963,833, Cl. 330-65.000.
Nogle, Scott G.; and Flannagan, Stephen T., 4,964,083, Cl. 365-189.110.
Peckham, David S., 4,963,843, Cl. 333-203.000.

Mototani, Yuji: *See*—
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Motte, Bruno P. J. M.: *See*—
Stuivenwold, Armand M.; Van Lammeren, Johannes P. M.; van Elk, Henricus T. P. J.; and Motte, Bruno P. J. M., 4,963,831, Cl. 329-318.000.

Moulin, Olivier. Water vehicle hull with a compliant lower portion. 4,963,111, Cl. 441-74.000.

Mountz, Michael C., to Motorola, Inc. High powered amplifier and heat sinking apparatus. 4,963,833, Cl. 330-65.000.

Moutafis, Timothy E.: *See*—
Kung, Robert T. V.; Moutafis, Timothy E.; and Ochs, Burt D., 4,962,765, Cl. 128-736.000.

Mouw, Kenneth W. Ozone generating tube. 4,963,331, Cl. 422-186.180.

Mowatt, Larry J.: *See*—
Peterson, Robert K.; Mowatt, Larry J.; and Poteet, Aaron D., 4,963,697, Cl. 174-252.000.

Mowry, Donald E. Cutting device for a board machine. 4,962,684, Cl. 83-332.000.

Moyer, Mark C.; Day, James B.; and Hirshberg, Alan J., to Exxon Production Research Company. Torque position make-up of tubular connections. 4,962,579, Cl. 29-407.000.

Mrotzeck, Uwe; Mischke, Peter; Schwaiger, Gunther; Russ, Werner; and Sittig, Manfred, to Hoechst Aktiengesellschaft. Process for the reduction of heavy metal ions in excess from aqueous synthesis solutions of water soluble heavy metal complex dyestuffs. 4,963,660, Cl. 534-618.000.

Mueller, Bruce M.: *See*—
Gross, Richard A.; and Mueller, Bruce M., 4,962,869, Cl. 222-153.000.

Muffett, Dorothy J.: *See*—
Schroeder, Lisa R.; and Muffett, Dorothy J., 4,963,380, Cl. 426-330.300.

Muijderman, Everhardus A.: *See*—
Sastra, Budiman; Fijnvandraat, Jacob G.; Maaswinkel, Leonardus H. M.; and Muijderman, Everhardus A., 4,964,008, Cl. 360-130.240.

Mukai, Miyako: *See*—
Kawakami, Yasushi; Hirata, Keiichi; Kamisaka, Mizuho; Mukai, Miyako; Ban, Tomohiro; and Ooishi, Minoru, 4,963,042, Cl. 400-17.000.

Mulhaupt, Rolf; and Simon, Hubert, to Ciba-Geigy Corporation. Adhesion promoters. 4,963,636, Cl. 528-28.000.

Muller-Beckmann, Bernd: *See*—
Holck, Jens-Peter; Mertens, Alfred; Kampe, Wolfgang; Muller-Beckmann, Bernd; Sponer, Gisbert; and Strein, Klaus, 4,963,686, Cl. 546-273.000.

Muller, Fritz. Injection molding method for plastic materials. 4,963,312, Cl. 264-327.000.

Muller, Joachim: *See*—
Braun, Rolf; Dorn, Alfred; and Muller, Joachim, 4,963,028, Cl. 356-445.000.

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Nelson, Jerald C., to Nichols Institute Diagnostics. Dialysis cell. 4,963,256, Cl. 210-232.000.
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Niebauer, Kenneth L.; and Lockard, Thomas A., to Kennametal Inc. Cutting insert with chip control. 4,963,060, Cl. 407-114.000.
Niedermeier, Gunther; Pausch, Helmut; Miehling, Wolfgang; Knobloch, Jurgen; and Helmich, Wolfgang, to WNC-Nitrochemie GmbH. Process for the preparation of propellant charge powder. 4,963,296, Cl. 264-3.200.
Nies, Helmut: *See*—
Driemel, Klaus; Bunthoff, Klaus; Nies, Helmut; and Rohe, Dieter, 4,963,629, Cl. 526-200.000.
Niessner, Werner, to Beru Reprecht GmbH & Co. KB. Spark plug having combined surface and air gaps. 4,963,784, Cl. 313-131.00R.
Nihon Junyaku Co., Ltd.: *See*—
Nishimura, Joji; Mototani, Yuji; Asaoka, Junichi; Yanagawa, Noriyuki; and Touma, Hiroshi, 4,963,447, Cl. 429-206.000.
Nihon Kohden Corporation: *See*—
Miyasaka, Katsuyuki; and Aoyagi, Takuo, 4,964,010, Cl. 361-18.000.
Nihon Tensaiseito Kabushiki Kaisha: *See*—
Kawase, Mitsuru; Tanimura, Masashi; Terasawa, Hidekazu; Nakamura, Sohei; Nagano, Takayuki; Higashimori, Shosuke;

Matsuki, Hiroshi; and Matsumoto, Hisashi, 4,963,230, Cl. 162-129.000.
Nikaido, Masaru: *See*—
Homma, Katsuhisa; Nikaido, Masaru; Ouchi, Yoshiaki; Yamazaki, Mutsuki; and Yoshizawa, Shuji, 4,963,893, Cl. 346-76.0PH.
Nikka Chemical Co., Ltd.: *See*—
Machida, Osamu; Yoshida, Tsutomu; Kimura, Norio; and Watanabe, Masatoshi, 4,963,157, Cl. 8-111.000.
Nikki Co., Ltd: *See*—
Matsumura, Mitsuma, 4,962,764, Cl. 128-691.000.
Nikon Corporation: *See*—
Inadome, Kiyotaka, 4,963,006, Cl. 350-427.000.
Nilsson, Ole K. Step-controllable electronic ballast. 4,963,795, Cl. 315-205.000.
Ninomiya, Yuichi: *See*—
Kitaura, Hiromu; Isobe, Mitsuo; Ninomiya, Yuichi; Ohtsuka, Yoshimichi; and Izumi, Yoshinori, 4,963,969, Cl. 358-174.000.
Niosi, Donald E.: *See*—
Braun, Stephen A.; O'Neill, Michael J.; Curry, Roger W.; Titze, James R.; Niosi, Donald E.; Fujikawa, Tetsuzo; Hirata, Makizo; and Nishimura, Michio, 4,962,631, Cl. 56-17.200.
Nippon Air Brake K.K.: *See*—
Otsuki, Noboru; Oonishi, Toshihiko; Tomioka, Katsumi; and Miura, Kozo, 4,962,881, Cl. 251-149.700.
Nippon Gohsei Kagaku Kogyo Kabushiki: *See*—
Kunieda, Makoto; and Takida, Hiroshi, 4,963,608, Cl. 524-394.000.
Nippon Hoso Kyokai: *See*—
Kitaura, Hiromu; Isobe, Mitsuo; Ninomiya, Yuichi; Ohtsuka, Yoshimichi; and Izumi, Yoshinori, 4,963,969, Cl. 358-174.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
Uzuka, Yoshiro; and Saito, Yoshiko, 4,963,588, Cl. 514-563.000.
Nippon Mining Co., Ltd.: *See*—
Yano, Kyoji; and Aizawa, Shirou, 4,963,248, Cl. 208-135.000.
Nippon Oil and Fats Company, Limited: *See*—
Shibato, Kishio; Sakurai, Fumio; Sakai, Atsuhiro; Imai, Toru; and Ohe, Osamu, 4,963,601, Cl. 523-339.000.
Nippon Peroxide Co., Ltd.: *See*—
Machida, Osamu; Yoshida, Tsutomu; Kimura, Norio; and Watanabe, Masatoshi, 4,963,157, Cl. 8-111.000.
Nippon Seido Kabushiki Kaisha: *See*—
Ono, Katsuyasu, 4,962,948, Cl. 280-804.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Asano, Yoshio; and Hattori, Masaru, 4,963,038, Cl. 384-15.000.
Nippon Sheet Glass Co., Ltd.: *See*—
Matsushita, Yoshimitsu; and Ohme, Katsuyoshi, 4,964,068, Cl. 364-520.000.
Nippon Soken, Inc.: *See*—
Sanuki, Masami; Itoigawa, Fumihiro; Kojima, Akikazu; Inagaki, Mitsuo; Yasuda, Masanori; Kurokawa, Yoshiki; Miyagawa, Kazuhito; Suzuki, Seiichiro; Iwanami, Shigeki; Kawasaki, Shiro; and Miura, Nobuhiro, 4,963,074, Cl. 417-222.000.
Nippon Steel Chemical Co., Ltd.: *See*—
Aida, Hiroshi; Hamada, Shoichi; and Kato, Hisanori, 4,963,087, Cl. 425-556.000.
Nippon Telegraph and Telephone Corporation: *See*—
Sato, Masaaki; and Arita, Yoshinobu, 4,963,242, Cl. 204-298.310.
Nippondenso Co., Ltd.: *See*—
Fujii, Tetsuo; Kuroyanagi, Susumu; and Tsuzuki, Yukio, 4,963,505, Cl. 437-62.000.
Sanuki, Masami; Itoigawa, Fumihiro; Kojima, Akikazu; Inagaki, Mitsuo; Yasuda, Masanori; Kurokawa, Yoshiki; Miyagawa, Kazuhito; Suzuki, Seiichiro; Iwanami, Shigeki; Kawasaki, Shiro; and Miura, Nobuhiro, 4,963,074, Cl. 417-222.000.
Zyokou, Keizou; Ito, Shinzo; and Sugiyama, Tsuyoshi, 4,963,707, Cl. 219-110.000.
Nishida, Akira: *See*—
Sato, Kazuo; Yanai, Toshiaki; Kinoto, Takao; Tanaka, Keiji; Nishida, Akira; Toyama, Toshimitsu; Frei, Bruno; and O'Sullivan, Anthony, 4,963,582, Cl. 514-450.000.
Nishida, Toshio: *See*—
Okuda, Takanari; Nomura, Shigeo; Shibahara, Itaru; Enokido, Yuji; Fujiwara, Masayuki; Nishida, Toshio; Teranishi, Hiroshi; Hirano, Susumu; Iseda, Aturou; and Nakajima, Motoharu, 4,963,200, Cl. 148-325.000.
Nishiike, Ujihiro; Kobayashi, Yasuhiro; Ishitobi, Hirotake; Sujita, Shigeko; Takahashi, Norio; Nakahara, Hisanao; and Inokuti, Yukio, to Kawasaki Steel Corp. Grain oriented electromagnetic steel sheets having a very low iron loss and method of producing the same. 4,963,197, Cl. 148-111.000.
Nishikawa, Masato: *See*—
Azuchi, Isamu; Fujikura, Hiroshi; Haruna, Yoshinobu; Onomoto, Ryuichi; and Nishikawa, Masato, 4,962,919, Cl. 271-3.100.
Nishimoto, Hidetoshi: *See*—
Shimogori, Kazutoshi; Satoh, Hiroshi; Toyama, Masao; Nishimoto, Hidetoshi; Ikeda, Koki; and Kawafuku, Junji, 4,963,440, Cl. 428-651.000.
Nishimoto, Yoshiharu, and Yamazaki, Kengo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Heat-shrinkable laminated film. 4,963,426, Cl. 428-213.000.
Nishimura, Joji; Mototani, Yuji; Asaoka, Junichi; Yanagawa, Noriyuki; and Touma, Hiroshi, to Matsushita Electric Industrial Co., Ltd.; and Nihon Junyaku Co., Ltd. Alkaline cell with gelled anode. 4,963,447, Cl. 429-206.000.
Nishimura, Michio: *See*—
Braun, Stephen A.; O'Neill, Michael J.; Curry, Roger W.; Titze, James R.; Niosi, Donald E.; Fujikawa, Tetsuzo; Hirata, Makizo; and Nishimura, Michio, 4,962,631, Cl. 56-17.200.
Nishio, Tomoyuki: *See*—
Iihoshi, Akira; Nakamura, Yukinobu; Matsumoto, Yoshiyuki; and Nishio, Tomoyuki, 4,963,864, Cl. 340-995.000.
Nishio, Yukio: *See*—
Sato, Hisashi; Nishio, Yukio; Hayashi, Hideharu; Yamamoto, Masaki; and Takahashi, Toru, 4,963,099, Cl. 439-76.000.
Nishiyama, Ryoji: *See*—
Nishizawa, Hiroyuki; Kashiwabara, Kimito; Nako, Osamu; Ishii, Mitsuaki; Yamane, Kouichi; Miyazaki, Masaaki; and Nishiyama, Ryoji, 4,962,742, Cl. 123-492.000.
Nishizawa, Hiroyuki; Kashiwabara, Kimito; Nako, Osamu; Ishii, Mitsuaki; Yamane, Kouichi; Miyazaki, Masaaki; and Nishiyama, Ryoji, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; and Mitsubishi Denki Kabushiki Kaisha. Fuel injection device for an internal combustion engine. 4,962,742, Cl. 123-492.000.
Nishizawa, Junichi; and Tamaoki, Yoshikatsu, to Nishizawa, Junichi. Holder with semiconductor lighting device. 4,964,023, Cl. 362-100.000.
Nishizawa, Tsutomu: *See*—
Tanaka, Eishi; Nishizawa, Tsutomu; and Yamada, Yasuyuki, 4,963,449, Cl. 430-59.000.
Nishizawa, Yukimasa: *See*—
Hirano, Akira; Watanabe, Shinichi; Fukuda, Yutaka; Higuchi, Yukio; Shibano, Fumio; Sekino, Hiroshi; Nabeshima, Hiroichi; and Nishizawa, Yukimasa, 4,962,664, Cl. 73-118.100.
Nissan Motor Co., Ltd.: *See*—
Gotoh, Miyuki, 4,964,031, Cl. 364-138.000.
Hosaka, Akio; and Tanaka, Kenichi, 4,962,570, Cl. 123-399.000.
Iwata, Toru; Katayose, Shinji; and Tamura, Minoru, 4,964,045, Cl. 364-426.020.
Matsuda, Toshiro, 4,964,047, Cl. 364-426.020.
Onda, Kiyoshi; and Nakajima, Tomoo, 4,962,564, Cl. 15-250.190.
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, 4,962,917, Cl. 269-56.000.
Tanaka, Hiroshi; Etoh, Yohsiyuki; and Takeuchi, Yasuhisa, 4,964,048, Cl. 364-426.040.
Throngnumchai, Kraisorn; and Murakami, Koichi, 4,963,970, Cl. 357-23.400.
Nisshin Steel Co., Ltd.: *See*—
Kuwano, Tomonori; and Omoda, Kazutoshi, 4,962,612, Cl. 52-506.000.
Nissinen, Erkki A. O.: *See*—
Backstrom, Reijo J.; Heinola, Kalevi E.; Honkanen, Erkki J.; Kaakkola, Seppo K.; Kairisalo, Pekka J.; Linden, Inge-Britt Y.; Mannisto, Pekka T.; Nissinen, Erkki A. O.; Pohto, Pentti; Pippuri, Aino K.; and Pystynen, Jarmo J., 4,963,590, Cl. 514-678.000.
Nito, Syoichi: *See*—
Kuriyama, Yasuhisa; Sakaguchi, Shuuzabu; Kohzaki, Toshiaki; and Nito, Syoichi, 4,963,232, Cl. 203-29.000.
Nittan Valve Co., Ltd.: *See*—
Himura, Masato; and Suzuki, Hiroshi, 4,963,121, Cl. 474-110.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Hibino, Ken; Okada, Takeshi; Nakao, Kazuo; and Sahashi, Yuko, 4,963,494, Cl. 435-288.000.
NKK Corporation: *See*—
Sugaya, Nobuyasu; Kondo, Munetaka; Murashita, Kikuji; and Kobayashi, Motoi, 4,964,059, Cl. 364-507.000.
Noda, Kazuo: *See*—
Samejima, Masayoshi; Noda, Kazuo; Kobayashi, Masao; and Ishikawa, Shigeyuki, 4,963,365, Cl. 424-46.00L.
Noda, Masaru: *See*—
Todaka, Yoshihiro; Imaide, Takuya; Kinugasa, Toshiro; and Noda, Masaru, 4,963,981, Cl. 358-213.130.
Noda, Yasuo; Hama, Michihisa; and Nakamura, Masahiro, to Sanyo Electric Co., Ltd. Insulating box and a method for its manufacture. 4,962,865, Cl. 220-444.000.
Noddin, Richard A.; Madenjian, Arthur R.; and Barry, Ralph J., Jr., to Boston Scientific Corporation. Balloon catheter. 4,963,313, Cl. 264-573.000.
Nodelman, Neil H.: *See*—
Krishnan, Sivaram; Keegan, Richard E.; Nodelman, Neil H.; and Lundy, Charles E., 4,963,598, Cl. 523-137.000.
Noesberger, Bruno; and Frey, Otto, to Sulzer Brothers Limited; and Protek AG. Metal tibial anchoring part for a partial knee joint prosthesis. 4,963,153, Cl. 623-20.000.
Nogami, Akira: *See*—
Nakano, Miegi; Seino, Minoru; Uehara, Masafumi; and Nogami, Akira, 4,963,473, Cl. 430-309.000.
Nogle, Scott G.; and Flannagan, Stephen T., to Motorola, Inc. Non-address transition detection memory with improved access time. 4,964,083, Cl. 365-189.110.
Noguchi, Robert Y.; and Roohr, Lawrence E., to Digital Equipment Corporation. Wide range high stability variable gain amplifier. 4,963,836, Cl. 330-254.000.
Noguchi, Yoji: *See*—
Yamane, Yasukuni; Kako, Noritoshi; Noguchi, Yoji; and Takakura, Masaki, 4,964,066, Cl. 364-518.000.
Nok Corporation: *See*—
Matsushima, Noboru, 4,962,936, Cl. 277-37.000.

Nolte, Saundra L.: *See*—
Hutchings, Richard S.; Nolte, Saundra L.; and Weaver, Jeffrey S., 4,963,287, Cl. 252-187.230.

Noma, Fumio: *See*—
Shimizu, Masataka; Hori, Ryuichi; Kimura, Yoshio; Noma, Fumio; Isobe, Mitsutoshi; Kamijo, Tsunao; and Inaba, Shinichi, 4,963,186, Cl. 75-378.000.

Nomura, Shigeo: *See*—
Okuda, Takanari; Nomura, Shigeo; Shibahara, Itaru; Enokido, Yuji; Fujiwara, Masayuki; Nishida, Toshio; Teranishi, Hiroshi; Hirano, Susumu; Iseda, Aturou; and Nakajima, Motoharu, 4,963,200, Cl. 148-325.000.

Nonini, Geremia, to Danieli & C. Officine Meccaniche SpA. Rolling stand with rolling rings supported as a cantilever and having their axes at an angle to each other. 4,962,655, Cl. 72-21.000.

Nordson Corporation: *See*—
Molnar, Julius J.; and Becker, Richard A., 4,963,392, Cl. 427-180.000.

Noren, Robert C.; and Vanek, Richard P., to General Atomics. Method of making compacts containing precise amounts of nuclear fuel. 4,963,758, Cl. 264-0.500.

Norian, Karl H.; and Rieck, Ulrich, to Wea Manufacturing Inc. Thin oriented polymer films containing metal-organic compounds. 4,963,429, Cl. 428-220.000.

Norsk Hydro a.s.: *See*—
N ss, Harald; and Sivertsen, Jan, 4,962,807, Cl. 164-444.000.

North American Philips Corp.: *See*—
Gibson, Ray, III; and Ravi, Jagannathan, 4,963,791, Cl. 313-25.000.

North American Philips Corp., Signetics Div.: *See*—
Dike, Charles E., 4,963,772, Cl. 307-480.000.

North, Peter C.; Oxford, Alexander W.; Cavalla, David J.; and Bays, David E., to Glaxo Group Limited. Ketone derivatives which are antagonists of 5-HT at 5-HT$_3$ receptors, compositions containing them, and method of use. 4,963,546, Cl. 514-214.000.

Northern Telecom Limited: *See*—
Aly, Sami A. H.; and Deczky, Andrew G., 4,964,118, Cl. 370-32.100.

Norstrup, Lynn L., Jr. Broiler oven. 4,962,695, Cl. 99-339.000.

Northwest Podiatric Laboratory, Inc.: *See*—
Brown, Dennis N., 4,962,593, Cl. 36-44.000.

Norwich Eaton Pharmaceuticals, Inc.: *See*—
Ebetino, Frank H., 4,963,681, Cl. 546-22.000.

Nosova, Larisa A.: *See*—
Bokareva, Elvina Z.; Schinkorenko, Jelena V.; Terenko, Viktor V.; Nosova, Larisa A.; Faidel, Garri I.; Nurmuchomedov, Sijar N.; Beljakov, Anatolij V.; Vlasov, Ivan M.; Fuerst, Anton; Herrmann, Heinz; Pantzer, Eckart; Stoehrer, Bernhard; Uhland, Eberhard; and Werner, Hans, 4,963,650, Cl. 528-481.000.

Notepen, Inc.: *See*—
Thomas, Paul R.; and Scott, William J., 4,963,048, Cl. 401-195.000.

Nothe, William E.: *See*—
Adamski, Joseph R.; Ferguson, Christopher; Prifti, William E.; and Nothe, William E., 4,963,714, Cl. 219-121.630.

Nottelmann, Donald A.; Wallace, Norman G.; and Stager, Joseph E., to Textro, Inc. Method of producing non-corrosive headed composite fasteners. 4,962,806, Cl. 164-112.000.

Noualhagnet, Pierre: *See*—
Laurent, Michel; Noualhagnet, Pierre; and Mathieu, Claude, 4,964,147, Cl. 378-125.000.

Novak, Robert L.: *See*—
Clark, Robert E.; Novak, Robert L.; and Amos, Dennis R., 4,962,586, Cl. 29-889.200.

Novak, Warren D., to Rank Video Services America. Tape interconnection system. 4,964,003, Cl. 360-96.100.

Novakovic, Mario; and Esposito, Michael A., to Finetex, Inc. Translucent combination soap-synthetic detergent bar. 4,963,284, Cl. 252-108.000.

Novoste Corporation: *See*—
Weldon, Thomas D., 4,963,306, Cl. 264-101.000.

Nozaki, Hisashi; and Sakurai, Seiya, to Kabushikikaisha Kibun; and Kabushikikaisha Kyowashokuhin. Process for producing konjak jelly. 4,963,383, Cl. 426-573.000.

Noziri, Hisao: *See*—
Nagasawa, Shigeru; Noziri, Hisao; Nakai, Yoshizumi; Araki, Yasuaki; Sakamoto, Eizo; Yagasaki, Masao; and Kozima, Mutsumi, 4,963,611, Cl. 524-459.000.

N ss, Harald; and Sivertsen, Jan, to Norsk Hydro a.s. Continuous of semi-continuous casting apparatus for casting metallic materials. 4,962,807, Cl. 164-444.000.

Nukii, Takashi: *See*—
Tagusa, Yasunobu; Matsubara, Hiroshi; and Nukii, Takashi, 4,963,002, Cl. 350-336.000.

Numa Tool Company: *See*—
Pascale, Jack H., 4,962,822, Cl. 175-258.000.

Numata, Masaaki: *See*—
Nagai, Yoshitaka; Shibayama, Shohei; Numata, Masaaki; Yoshimura, Shoji; Tanaka, Makoto; Ito, Masayoshi; Awaya, Akira; Kobayashi, Hisashi; Abe, Hayao; Ishizuka, Yusaku; and Ogawa, Tomoya, 4,963,653, Cl. 530-322.000.

Numata, Mitsuo; Minamida, Isao; and Tsushima, Susumu, to Takeda Chemical Industries, Ltd. Cephalosporin derivatives. 4,963,542, Cl. 514-206.000.

Numonics Corporation: *See*—
Phillips, Mark J.; Philbin, Patrick T.; and Blesser, Barry A., 4,963,703, Cl. 178-19.000.

Nurmuchomedov, Sijar N.: *See*—
Bokareva, Elvina Z.; Schinkorenko, Jelena V.; Terenko, Viktor V.; Nosova, Larisa A.; Faidel, Garri I.; Nurmuchomedov, Sijar N.; Beljakov, Anatolij V.; Vlasov, Ivan M.; Fuerst, Anton; Herrmann, Heinz; Pantzer, Eckart; Stoehrer, Bernhard; Uhland, Eberhard; and Werner, Hans, 4,963,650, Cl. 528-481.000.

Nussrallah, Steve: *See*—
Harney, Michael; Doremus, Mark; Nussrallah, Steve; Lowcock, Roy; and West, Lamar, Jr., 4,963,966, Cl. 358-349.000.

Nutter, Robert F.: *See*—
Mayweather III, William T.; and Nutter, Robert F., 4,963,964, Cl. 358-134.000.

Oana, Yasuhisa: *See*—
Fukasawa, Yoshiharu; Kawai, Mituo; Ishihara, Hideo; Umeki, Takenori; and Oana, Yasuhisa, 4,963,240, Cl. 204-192.150.

Obama, Masao; and Kikuchi, Masaaki, to Kabushiki Kaisha Toshiba. Current sensor having an element made of amorphous magnetic metal. 4,963,818, Cl. 324-117.00R.

Obara, Haruki, to Fanuc Ltd. Electric discharge position detecting device of a wire electric discharge machine. 4,963,711, Cl. 219-69.120.

Obinata, Hajime, to Nakamichi Corporation. Digital to analog converter with compensation memory addressed by lower order bits. 4,963,870, Cl. 341-118.000.

Obitz, Daniel: *See*—
Manoury, Philippe; Binet, Jean; Obitz, Daniel; Defosse, Gerard; Dewitte, Elisabeth; and Veronique, Corinne, 4,963,680, Cl. 544-395.000.

Obligin, Alan S.: *See*—
Morgan, Charles R.; Chen, Cheng-Chi; Blinka, Thomas A.; and Obligin, Alan S., 4,963,266, Cl. 210-640.000.

Obrecht, Werner: *See*—
Szentivanyi, Zsolt; Obrecht, Werner; and Wassen, Jurgen, 4,963,621, Cl. 525-207.000.

OCE Nederland B.V.: *See*—
de Jong, Adrianus; G. M.; and van Soest, Hendrikus J. J., 4,963,931, Cl. 355-218.000.

Ochs, Burt D.: *See*—
Kung, Robert T. V.; Moutafis, Timothy E.; and Ochs, Burt D., 4,962,765, Cl. 128-736.000.

O'Connell, Peter: *See*—
White, Raymond L.; Nakamura, Yusuke; O'Connell, Peter; and Leppert, Mark F., 4,963,663, Cl. 536-27.000.

O'Connell, Richard J.; Rai, Chandra S.; and Sondergeld, Carl H., to Amoco Corporation. Method for characterizing velocity estimates. 4,964,086, Cl. 367-38.000.

Odawara, Akio: *See*—
Iwakuma, Takeo; Sekine, Yasuo; Sasaki, Yasuhiko; Ikezawa, Katsuo; and Odawara, Akio, 4,963,587, Cl. 514-562.000.

Oehme, Dieter: *See*—
Tappe, Horst; Oehme, Dieter; Schlafer, Ludwig; and Russ, Werner H., 4,963,661, Cl. 534-642.000.

Ogata, Tomohide: *See*—
Iwata, Ritsuo; Ogata, Tomohide; Omoto, Kaneo; Nagashima, Hironao; Nakajima, Koji; and Miyamoto, Yutaka, 4,963,214, Cl. 156-276.000.

Ogawa, Hiroshi; Tamai, Yasuo; and Kawamata, Toshio, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,963,433, Cl. 428-323.000.

Ogawa, Hiroshi: *See*—
Horimai, Hideyoshi; and Ogawa, Hiroshi, 4,964,110, Cl. 369-110.000.
Sako, Yoichiro; and Ogawa, Hiroshi, 4,964,128, Cl. 371-39.100.

Ogawa, Masahide: *See*—
Okabayashi, Seiji; Watanabe, Hirofumi; Abe, Kiyoshi; and Ogawa, Masahide, 4,963,519, Cl. 502-63.000.

Ogawa, Masahiko: *See*—
Isobe, Koukichi; and Ogawa, Masahiko, 4,963,221, Cl. 156-358.000.

Ogawa, Masashi; Shiraishi, Hisashi; and Ikeda, Teppei, to Director of The Finance Division Minister's Secretariat Science and Technology Agency. Medium for electrophoresis. 4,963,243, Cl. 204-299.00R.

Ogawa, Tomoya: *See*—
Nagai, Yoshitaka; Shibayama, Shohei; Numata, Masaaki; Yoshimura, Shoji; Tanaka, Makoto; Ito, Masayoshi; Awaya, Akira; Kobayashi, Hisashi; Abe, Hayao; Ishizuka, Yusaku; and Ogawa, Tomoya, 4,963,653, Cl. 530-322.000.

Ogawa, Toshio; Katakura, Kageyoshi; Kondo, Shin-ich; Umemura, Shin'ichiro; Ikeda, Hiroshi; Ichikawa, Noriyoshi; and Kuriyama, Kinji, to Hitachi, Ltd.; and Hitachi Medical Corporation. Ultrasonic imaging apparatus. 4,962,667, Cl. 73-626.000.

Ohbayashi, Keiji: *See*—
Murai, Kazuhiro; Ohbayashi, Keiji; and Onodera, Kaoru, 4,963,475, Cl. 430-467.000.

Ohe, Hidemi, to NEC Home Electronics Ltd. Navigation device for use in a vehicle. 4,964,052, Cl. 364-449.000.

Ohe, Osamu: *See*—
Shibato, Kishio; Sakurai, Fumio; Sakai, Atsuhiro; Imai, Toru; and Ohe, Osamu, 4,963,601, Cl. 523-339.000.

Ohemeng, Kwasi A.: *See*—
Tidwell, Richard R.; Geratz, Dieter J.; and Ohemeng, Kwasi A., 4,963,589, Cl. 514-636.000.

Ohi, Susumu; Nakamae, Masahiko; and Shiba, Hiroshi, to NEC Corporation. Semiconductor device having bipolar transistor with trench. 4,963,957, Cl. 357-34.000.

Ohira, Tadashi: *See*—
Maruta, Syuzi; Ito, Masazumi; and Ohira, Tadashi, 4,963,946, Cl. 355-308.000.

Ohme, Katsuyoshi: *See*—
Matsushita, Yoshimitsu; and Ohme, Katsuyoshi, 4,964,068, Cl. 364-520.000.
Ohmura, Atsuo: *See*—
Nemoto, Mitsugu; Ohmura, Atsuo; Koiso, Jun-ichi; and Ishii, Kohji, 4,963,940, Cl. 355-260.000.
Ohno, Eishi; and Nakamura, Norihiko, to Toycta Jidosha Kabushiki Kaisha. Fuel supply device of an engine. 4,962,745, Cl. 123-533.000.
Ohno, Kiyotaka: *See*—
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Perner, Johann, to Koflach Sport Gesellschaft m.b.H. & Co. KG. Ski shoe. 4,962,595, Cl. 36-121.000.

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Schoenleber, Robert W.; Kebabian, John W.; Martin, Yvonne C.; DeNinno, Michael P.; Perner, Richard J.; Stout, David M.; Hsiao, Chi-Nung W.; DiDomenico, Stanley, Jr.; DeBernardis, John F.; Basha, Fatima Z.; Meyer, Michael D.; and De, Biswanath, 4,963,568, Cl. 514-320.000.

Perotto, Christian, to S.N.C. Livbag. Process for the manufacture of charges of a solid composition generating nontoxic gases and charges thus obtained. 4,963,202, Cl. 149-35.000.

Perr, Julius P.; Liang, Eric; Yu, Robert C.; and Ghuman, Amarjit S., to Cummins Engine Company, Inc. Injection rate control cam. 4,962,743, Cl. 123-496.000.

Perricone, Alphonse C.; Clapper, Dennis K.; and Enright, Dorothy P., to Baker Hughes Incorporated. Modified non-polluting liquid phase shale swelling inhibition drilling fluid and method of using same. 4,963,273, Cl. 252-8.510.

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Perrotta, Giorgio; and Losquadro, Giacinto, to Selenia Spazio S.p.A. Antenna tracking system using sequential lobing. 4,963,890, Cl. 342-359.000.

Perry, John S.; and Stowe, Harold A., to Boeing Company, The. Transition fitting for high strength composite. 4,962,904, Cl. 244-131.000.

Peter Wolters AG: *See—*
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Peterson, Francis C., to Buell Industries, Inc. Fabric fastener. 4,963,064, Cl. 411-387.000.

Peterson, Robert K.; Mowatt, Larry J.; and Poteet, Aaron D., to Texas Instruments Incorporated. Advanced polymers on metal printed wiring board. 4,963,697, Cl. 174-252.000.

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Petro-Canada Inc.: *See—*
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Pettigrew, Robert: *See—*
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Pfizer Inc.: *See—*
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Phillips, Paul A., to Coca-Cola Company, The. Non-attended, self-service cup vender. 4,962,866, Cl. 221-8.000.

Phillips Petroleum Company: *See—*
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Picard, Jean-Louis: *See—*
Calvignac, Jean; Dauphin, Michel; Lenoir, Raymond; and Picard, Jean-Louis, 4,964,127, Cl. 371-37.100.

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Semeraro, Claudio; Micheli, Dino; Pieraccioli, Daniele; Gaviraghi, Giovanni; and Borthwick, Alan D., 4,963,571, Cl. 514-356.000.

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Pisors, George L.; and Taoka, James T., to Cablelift Oil Corporation. Liquid lift. 4,962,847, Cl. 198-643.000.

Pitney Bowes Inc.: *See—*
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Pixley, Robin A., to Temple University of the Commonwealth System of Higher Education. Monoclonal antibodies to the light chain region of human factor XII and methods of preparing and using the same. 4,963,657, Cl. 530-387.000.

Pizzo, Joseph. Cycling automatic wheel lockup control apparatus. 4,962,972, Cl. 303-116.000.

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Ploetz, Wiebke: *See—*
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Polacek, Manfred, to Wacker Werke GmbH & Co. KG. Vibrating roll apparatus. 4,962,644, Cl. 60-435.000.

Pollock, Clifford R.; Georgiou, Efstratios T.; and Carrig, Timothy J., to Cornell Research Foundation, Inc. Lasers in alkali halides using N and R color-centers. 4,964,133, Cl. 372-42.000.

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Poteet, Aaron D.: *See—*
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Potts, Frank. Dual transmission-fluid-level maintenance system. 4,962,830, Cl. 184-6.400.

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Prevent Products, Inc.: *See—*
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Chamberlain, Harry R., 4,963,226, Cl. 159-48.100.
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Propper Manufacturing Co., Ltd.: *See—*
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Protek AG: *See—*
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Prus, Eric; and Lacchia, Adrien, to Sames S.A. Installation for spraying coating product, notably water-soluble paint. 4,962,724, Cl. 118-683.000.

Pruss, Ludwig, to Volkswagen AG. System for preventing undesired vehicle acceleration. 4,962,835, Cl. 192-0.030.

Puhler, Alfred: *See—*
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Puls, Kenneth B., to Winzeler Stamping Company. Method of making a composite male hose coupler having integrally molded nut. 4,962,582, Cl. 29-527.400.

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Pura, Michael A. Modular brick chimney unit. 4,962,621, Cl. 52-218.000.

Purzycki, Kenneth L.; and Virgilio, Joseph A., to Givaudan Corporation. Preservatives containing β-bromo-β-nitrostyrene for use in aqueous systems. 4,963,179, Cl. 71-67.000.

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Quan, Ronald; and Bayley, Brian J., to Hewlett-Packard Company. Focused line identifier for a bar code reader. 4,963,756, Cl. 250-568.000.

Quan, Ronald, to Hewlett-Packard Company. Low noise current mirror active load circuit. 4,963,764, Cl. 307-270.000.

Quantum Chemical Corporation: *See—*
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Quattrini, Thomas J.: *See—*
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Queen, Lawrence D.: *See—*
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Quist, Bernardus B.: *See—*
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R. H. Peterson Company: *See—*
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R. J. Reynolds Tobacco Company: *See—*
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Raber, Arthur. Pickup tool with positional locking device. 4,962,957, Cl. 294-19.100.

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Raeymaekers, Alfons H. M.: *See—*
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Rahman, Yueh-Erh; and Venkataram, Suresh, to University of Minnesota, Regents of the. Freeze-dried liposome mixture containing cyclosporin. 4,963,362, Cl. 424-450.000.
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Rainbow Lifegard Products, Inc.: *See*—
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Randell, Donald R., to Ciba-Geigy Corporation. Polymers. 4,963,631, Cl. 526-240.000.
Ranjan, Radhakrishnan; and Lazenby, William E., to General Electric Company. Thermal withstand capability of a filament wound epoxy fuse body in a current-limiting fuse. 4,963,850, Cl. 337-246.000.
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Reeves, Michael A., to Valco Cincinnati, Inc. Applicator utilizing high speed non-contact extrusion valve. 4,962,871, Cl. 222-504.000.
Reiche, Carl-Heinz; and Arnold, Hans. to Reiche & Co. Manually height-adjustable steering column of power vehicle. 4,962,944, Cl. 280-775.000.
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Reiche, Carl-Heinz; and Arnold, Hans, 4,962,944, Cl. 280-775.000.
Reichenberger, Helmut; Naser, Georg; and Jahn, Helmut, to Siemens Aktiengesellschaft. Coupling member for a shock wave therapy device. 4,962,752, Cl. 128-24.00A.
Reilly, James L.; and Bohen, Joseph M., to Pennwalt Corporation. Compositions and methods using organosulfides for stabilization of polyolefins against photodegradation. 4,963,607, Cl. 524-291.000.
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Sanderson, Michael L.; and Heritage, John R., 4,962,670, Cl. 73-861.190.

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Kung, Viola T.; Nagainis, Peter A.; and Sheldon, Edward L., III, 4,963,658, Cl. 530-406.000.

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Wanlass, Mark W.; and Sheldon, Peter, 4,963,949, Cl. 357-16.000.

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Clomburg, Lloyd A., Jr.; and Crenwelge, Otto E., Jr., 4,963,163, Cl. 48-210.000.
Scott, Andrew M.; Quist, Bernardus B.; and Terlouw, Teunis, 4,963,065, Cl. 414-217.000.
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Okuda, Takanari; Nomura, Shigeo; Shibahara, Itaru; Enokido, Yuji; Fujiwara, Masayuki; Nishida, Toshio; Teranishi, Hiroshi; Hirano, Susumu; Iseda, Aturou; and Nakajima, Motoharu, 4,963,200, Cl. 148-325.000.

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Hirano, Akira; Watanabe, Shinichi; Fukuda, Yutaka; Higuchi, Yukio; Shibano, Fumio; Sekino, Hiroshi; Nabeshima, Hiroichi; and Nishizawa, Yukimasa, 4,962,664, Cl. 73-118.100.

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Fushiya, Fusao; Yamazaki, Takashi; and Shibata, Mitsuyoshi, 4,962,588, Cl. 30-372.000.

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Shida, Kozo: *See*—
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Kutra, Sauljus I.; Tokarev, Ian I.; Chinikas, Cheslovas V.; Dokshus, Kazimeras-Motejus K.; and Shileika, Antanas-Sigitas V., 4,962,597, Cl. 37-117.500.

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Kano, Akiko; Tsuchino, Hisanori; Nakano, Kuniaki; Shimada, Fumio; and Honda, Satoshi, 4,963,751, Cl. 250-484.100.

Shimamura, Hideaki; Sakata, Masao; Kobayashi, Shigeru; Yoncoka, Yuji; Kamei, Tsuneaki; Kawahito, Tsuneyoshi; Fujita, Shoyo; and Nakamura, Hiroshi, to Hitachi, Ltd. Sputtering process and an apparatus for carrying out the same. 4,963,239, Cl. 204-192.120.

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Imon, Kazutoshi; Fukushima, Kensuke; and Shimizu, Hiroshi, 4,962,816, Cl. 172-821.000.

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Shimoji, Masao: *See*—
Khattak, Anwar S.; and Shimoji, Masao, 4,963,096, Cl. 434-21.000.

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Andou, Hirokazu; Shimomura, Tatsuhiko; and Kikuchi, Hiroshi, 4,962,876, Cl. 228-193.000.

Shimotono, Susumu, to Ricoh Company, Ltd. Communication adapter device for use with a facsimile device combined with a computer. 4,964,154, Cl. 379-100.000.

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Morita, Yoshiharu; Imaki, Naoshi; Shirasaka, Tadashi; and Shimpuku, Tetsuro, 4,963,684, Cl. 546-90.000.

Shimura, Satoshi: *See*—
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Goto, Kazumasa; Shin, Hiroto; Ishida, Hideki; Goto, Yasuo; and Iwahashi, Akira, 4,963,517, Cl. 501-122.000.

Shin, Masaaki; Hirayama, Nobuhiro; Ishikawa, Keiichi; and Misawa, Akira, to Mitsui Toatsu Chemicals, Incorporated. Electrophotographic toner. 4,963,456, Cl. 430-109.000.

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Horiuchi, Michio; and Machii, Tsuyoshi, 4,963,514, Cl. 501-32.000.

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Shinohe, Takashi; and Nakagawa, Akio, to Kabushiki Kaisha Toshiba. Gate turn-off thyristor with switching control field effect transistor. 4,963,972, Cl. 357-38.000.

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Ishikawa, Shunichi; and Shinozaki, Fumiaki, 4,963,458, Cl. 430-138.000.

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Adachi, Takuya; Ito, Sukenori; Shiosaka, Akihiro; Yuzawa, Atsushi; Takada, Masaaki; Okano, Kiichiro; Kurihara, Masaru; and Uchiyama, Hiromitsu, 4,963,335, Cl. 422-302.000.

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Ogawa, Masashi; Shiraishi, Hisashi; and Ikeda, Teppei, 4,963,243, Cl. 204-299.00R.

Shirakawa, Hiroshi: *See*—
Minagawa, Yoshiji; Shirakawa, Hiroshi; Yamazaki, Hiroshi; and Ito, Yoshiaki, 4,963,763, Cl. 307-35.000.

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Ito, Keizo; and Shoda, Mitsuyuki, 4,962,961, Cl. 296-192.000.

Shook, Larry E.: *See*—
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Showa Aluminum Corporation: *See*—
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Iwai, Ichiro; Nagai, Shigekazu; and Otsuka, Tatsuo, 4,962,880, Cl. 228-183.000.

Shoyab, Mohammed; Marquardt, Hans; and Todaro, George J., to Oncogen. Brain derivable polypeptide factors and antibodies thereto. 4,963,485, Cl. 435-7.000.

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McAdam, Peter L.; Schnerk, Thomas G.; and Shreve, Gregory A., 4,964,162, Cl. 380-14.000.

Shu, Paul, to Mobil Oil Corporation. Selective gel system for permeability profile control. 4,963,597, Cl. 523-130.000.

Shuert, Lyle H. Roof ridge vent. 4,962,692, Cl. 98-42.210.

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Khan, Mirza M. T.; and Siddiqui, M. R. H., 4,963,295, Cl. 260-409.000.

Sidhu, Trilochan S. Method for preparing a biological extract for regenerating the hair and skin, and apparatus for performing the method. 4,963,353, Cl. 424-74.000.

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Hughes, Timothy R.; and Siebert, Theodore A., Jr., 4,962,719, Cl. 114-343.000.

Siefkes, Jerry D.; Harpold, John G.; and Schatz, Douglas S. Method for removal of electrical shorts in a sputtering system. 4,963,238, Cl. 204-192.120.

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Amann, Markus-Christian; Thulke, Wolfgang; and Baumann, Gerhard, 4,963,507, Cl. 437-130.000.
Appelmann, Wolfgang, 4,964,112, Cl. 370-13.000.
Fischer, Georg, 4,964,132, Cl. 372-32.000.
Hofmann, Ruediger, 4,963,863, Cl. 340-825.880.
Kattner, Erich, 4,963,897, Cl. 346-140.00R.
Kaul, Karlheinz; Saffer, Edmund; and Bock, Hans-Christian, 4,964,152, Cl. 378-198.000.
Otto, Johann; and Plies, Erich, 4,963,823, Cl. 324-158.00R.
Reichenberger, Helmut; Naser, Georg; and Jahn, Helmut, 4,962,752, Cl. 128-24.00A.
Stehle, Heinz; Weidinger, Hans; Steinberg, Eckard; and Garzarolli, Friedrich, 4,963,316, Cl. 376-416.000.
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Sigler, Gerald F.: *See*—
Chavez, Rodrigo G.; David, Harold; Metzner, Ernest K.; Sigler, Gerald F.; and Winn-Deen, Emily S., 4,963,479, Cl. 435-22.000.

Silva, Fernando G.: *See*—
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Simmonds Precision Products, Inc.: *See*—
Spillman, William B.; and Andressen, Richard P., 4,963,729, Cl. 250-227.210.

Simmons, Thomas R. Inflatable aquatic device. 4,962,921, Cl. 272-1.00B.

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Cuperman, Vladimir M.; Pettigrew, Robert; and Watts, Lloyd, 4,963,034, Cl. 381-36.000.

Simon, Hubert: *See*—
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Simon, Rudolf: *See*—
Wurst, Manfred P.; Simon, Rudolf; and Kahlden, Thomas V., 4,963,069, Cl. 414-416.000.

Simonazzi A. & L. S.p.A.: *See*—
Limoni, Alfredo, 4,962,842, Cl. 198-443.000.

Sims, Earnest, Jr. Portable reinforced asphalt tile. 4,963,055, Cl. 404-41.000.

Singh, Baldev: *See*—
Lesher, George Y.; Bacon, Edward R.; Singh, Baldev; and Kuo, Gee-Hong, 4,963,561, Cl. 514-303.000.

Sinh, Nguyen X., to National Semiconductor Corporation. Two-level ECL multiplexer without emitter dotting. 4,963,767, Cl. 307-455.000.

Sinor, Lyle T.; Eatz, Ralph A.; Stone, Darryl L.; and Plapp, Fred V., to Immucor, Inc. Article for preforming immunological assays utilizing organic dyes and method for producing and utilizing same. 4,963,478, Cl. 435-7.000.

Sipido, Victor: *See*—
Freyne, Eddy J. E.; Raeymaekers, Alfons H. M.; Sipido, Victor; and Venet, Marc G., 4,963,573, Cl. 514-357.000.

Sira Limited: *See*—
West, Robert N., 4,963,018, Cl. 356-1.000.

Sisko, John T.: *See*—
Calabria, Ralph; Hartner, Frederick W.; and Sisko, John T., 4,963,534, Cl. 514-54.000.

Sitek, Franciszek: *See*—
Klingert, Bernd; Sitek, Franciszek; and Rembold, Manfred, 4,963,470, Cl. 430-281.000.

Sittig, Manfred: *See*—
Mrotzeck, Uwe; Mischke, Peter; Schwaiger, Gunther; Russ, Werner; and Sittig, Manfred, 4,963,660, Cl. 534-618.000.

Sivertsen, Jan: *See*—
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SKC Limited: *See*—
Lee, Jung Kwan, 4,962,898, Cl. 242-199.000.

Skidmore, Ian F.; Naylor, Alan; Finch, Harry; Lunts, Lawrence H. C.; and Campbell, Ian B., to Glaxo Group Ltd. Phenethanolamine derivatives. 4,963,564, Cl. 514-311.000.

Skobic, Davor; and Kolin, Ivo, to Sour "Gavrilovic". Apparatus for the continuous sterilization of foodstuffs arranged in particular in containers. 4,962,700, Cl. 99-470.000.

Skraba, Joseph S.: *See*—
Hofmann, Aaron A.; and Skraba, Joseph S., 4,963,152, Cl. 623-18.000.

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Alexion, Christopher C.; Hordubay, Thomas D.; Mamrose, Wesley; Walk, Steven R.; and Slepian, Robert M., 4,963,694, Cl. 174-15.600.

Smart Design, Inc.: *See*—
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Smets, Bruno M. J.: *See*—
Verlijsdonk, Johannus G.; and Smets, Bruno M. J., 4,963,787, Cl. 313-486.000.

Smith, David C.: *See*—
Helmke, Richard W.; Smith, David C.; and Levine, Mark P., 4,962,556, Cl. 14-2.400.

Smith, George E., to Hewlett-Packard Company. Nonimaging light source. 4,964,025, Cl. 362-346.000.

Smith, Gregory C., to Texas Instruments Incorporated. Method of reducing tungsten selectivity to a contact sidewall. 4,963,511, Cl. 437-192.000.

Smith, Harry F. Minimal connectivity parallel data processing system. 4,964,032, Cl. 364-200.000.

Smith International, Inc.: *See*—
DeLucia, Frank, 4,962,818, Cl. 175-75.000.

Smith & Mahoney, P.C.: *See*—
Galgana, Russell J., 4,962,894, Cl. 241-30.000.

Smith, Roger D.: *See*—
Wiatt, James G.; Swiderski, Kevin J.; Belcher, Samuel L.; and Smith, Roger D., 4,963,086, Cl. 425-526.000.

Smith, Ronald L.: *See*—
Ingermann, Donald E.; Smith, Ronald L.; Caffrey, Stephen F.; and Steinhoff, Lonney J., 4,962,565, Cl. 15-302.000.

Smith, Trevor S.: *See*—
Jandu, Jaswinder S.; and Smith, Trevor S., 4,964,078, Cl. 365-51.000.

Smith, Wilbur C.: *See*—
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SmithKline Beecham Corporation: *See*—
Badger, Alison M.; Cheeseman, Elaine N.; DiMartino, Michael J.; Dorman, James W.; Mirabelli, Christopher K.; Picker, Donald H.; and Schwartz, David A., 4,963,557, Cl. 514-278.000.
Lafferty, John J.; Demarinis, Robert M.; and Shah, Dinubhai H., 4,963,547, Cl. 514-217.000.

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Svagr, Alexander, 4,962,657, Cl. 72-238.000.

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Beaujean, Hans-Josef; Eisenblaetter, Horst; Fues, Johann F.; Giesen, Brigitte; Holz, Erich; Jahnke, Ulrich; Kuenzel, Werner; Meffert, Alfred; Schwadtke, Karl; Smulders, Eduard; Sung, Eric; Syldatk, Andreas; Toelken, Hans-Georg; and Wegener, Ingo, 4,963,158, Cl. 8-137.000.

Smyser, Granville L.; and Brooks, Gary T., to Amoco Corporation. Injection moldable blends of poly(etherketones) and polyamide-imides. 4,963,627, Cl. 525-420.000.

Snead, Wilford A., to Unitek Corporation. Buccal tube applicance for rectangular or round wire. 4,963,092, Cl. 433-17.000.

Snodgrass, Warren. Flexible plastic seating shell. 4,962,964, Cl. 297-457.000.

Snyder, Richard N.; and Rainwater, Percy R. Electric/non-electric initiation system. 4,962,708, Cl. 102-275.110.

So, Bernard Y. C.; and Marker, Terry L., to Amoco Corporation. Kerogen agglomeration process for oil shale beneficiation using organic liquid in precommunication step. 4,963,250, Cl. 208-426.000.

Societe Anonyme dite: Alsthom Fluides: *See—*
Fournier, Thierry, 4,963,057, Cl. 405-93.000.

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Fourquier, Dominique; and Perronin, Jean, 4,963,617, Cl. 524-805.000.

Sodeno, Toshiaki, to Yoshida Kogyo K.K. Parts applying apparatus. 4,962,875, Cl. 227-149.000.

Soderberg, Paul B., to Soderberg Research & Development, Inc. Hemi-wedge valve. 4,962,911, Cl. 251-159.000.

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Soderberg, Paul B., 4,962,911, Cl. 251-159.000.

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Solid Flue Chimney Systems, Inc.: *See—*
LaFleur, Joseph R., 4,963,191, Cl. 106-698.000.

Someda, Carlo G., to Pirelli General plc. Circular birefringent dielectric wave guide. 4,962,994, Cl. 350-96.330.

Somers, Jeffrey S.: *See—*
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Son, Masayoshi, to Datanet Corp. Communication system having an automatic dialer. 4,964,159, Cl. 379-356.000.

Sondergeld, Carl H.: *See—*
O'Connell, Richard J.; Rai, Chandra S.; and Sondergeld, Carl H., 4,964,086, Cl. 367-38.000.

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Morgan, Douglas R.; and Sones, Richard A., 4,963,746, Cl. 250-363.020.

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Song, William S.: *See—*
Musicus, Bruce R.; and Song, William S., 4,964,126, Cl. 371-36.000.

Song, Yoon S.: *See—*
Fenoglio, David J.; Song, Yoon S.; and Basalay, Robert J., 4,963,277, Cl. 252-51.50A.

Soni, Pravin L.: *See—*
Cuellar, Enrique; Powell, Stephen F.; Roberts, Daniel R.; and Soni, Pravin L., 4,962,996, Cl. 350-96.340.

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Anju, Shinji, 4,963,097, Cl. 434-431.000.
Hareyama, Nobuo, 4,963,838, Cl. 331-2.000.
Horimai, Hideyoshi; and Ogawa, Hiroshi, 4,964,110, Cl. 369-110.000.
Kanota, Keiji; and Murabayashi, Noboru, 4,964,000, Cl. 360-77.140.
Ohtsu, Masahiro; and Kurita, Tohru, 4,964,108, Cl. 369-19.000.
Sako, Yoichiro; and Ogawa, Hiroshi, 4,964,128, Cl. 371-39.100.
Takayama, Jun; Tachi, Katsuichi; Suzuki, Hideto; and Masuzaki, Kenshiro, 4,963,868, Cl. 341-72.000.

Soos, Ruldof: *See—*
Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo ; Soos, Ruldof; Radvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, 4,963,584, Cl. 514-521.000.

Sotome, Kenichi; and Nagasaki, Munetaka, to SSMC Inc. Device for drawing towel cloth. 4,962,712, Cl. 112-121.260.

Sotralentz S.A.: *See—*
Wendling, Bruno; and Roser, Georges, 4,962,863, Cl. 220-69.000.

Sour "Gavrilovic": *See—*
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Vajtner, Zlatko; Lopotar, Nevenka; and Djokic, Slobodan, 4,963,528, Cl. 514-29.000.

Southeast Container Corp.: *See—*
Detrick, John E., 4,963,070, Cl. 414-492.000.

Sowa, Takayoshi: *See—*
Iwanaga, Shoichi; Fujiwara, Akio; Sowa, Takayoshi; and Yokono, Hitoshi, 4,963,512, Cl. 437-192.000.

Sowards, Brian D., to Ingersoll-Rand Company. Bearing mounting with self-compensation for thermal expansion. 4,963,041, Cl. 384-493.000.

Spalding & Evenflo Companies, Inc.: *See—*
Glover, Richard W., 4,962,965, Cl. 297-467.000.

Sparagna, Stephen M., to Raytheon Company. Dielectric resonator filter. 4,963,841, Cl. 333-202.000.

Spark Innovations, Inc.: *See—*
Dickie, Robert G., 4,963,104, Cl. 439-460.000.

Spataro, Vincent J., to Plessey Electronic Systems Corp. Current limited quasi-resonant voltage converting power supply. 4,964,028, Cl. 363-056.000.

Spaulding, Carl P., to TRJ & Company. Incremental encoder. 4,963,733, Cl. 250-231.160.

Spectra-Physics: *See—*
Brooks, Michael T.; and Cherry, Craig D., 4,963,719, Cl. 235-462.000.

Spencer, Robert J., to Allied-Signal Inc. Apparatus for recovering solvent from solvent laden process air streams. 4,963,168, Cl. 55-180.000.

Spencer, Sidney H.: *See—*
Savage, Dale A.; and Spencer, Sidney H., 4,964,020, Cl. 361-429.000.

Spielman, Lyle S., to Eclipse, Inc. High turndown burner with integral pilot. 4,963,089, Cl. 431-351.000.

Spillman, William B.; and Andressen, Richard P., to Simmonds Precision Products, Inc. Optically powered sensor system with improved signal conditioning. 4,963,729, Cl. 250-227.210.

Spink, Donald R.: *See—*
Burgess, J. Stuart; Spink, Donald R.; and Stein, Jerry Y., 4,963,329, Cl. 422-168.000.

Spittal, Douglas W.: *See—*
Roberts, Edward; Greatorex, James H.; and Spittal, Douglas W., 4,963,403, Cl. 428-31.000.

Sponer, Gisbert: *See—*
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Sprecker, Mark A.; and Greene, Roger E., to International Flavors & Fragrances Inc. 2,4,4-irisubstituted tetrahydro pyranyl esters and organoleptic uses thereof. 4,963,285, Cl. 252-174.110.

Springer, James P.: *See—*
Currie, Sara A.; Miller, Thomas W.; Dulaney, Eugene L.; Springer, James P.; Valiant, Mary E.; Mochales del Val, Sagrario; and Zimmerman, Sheldon B., 4,963,569, Cl. 514-326.000.

Square D Company: *See—*
Brown, Robert J., Jr., 4,964,058, Cl. 364-492.000.
Palmer, Neil R.; and Rustebakke, Paul, 4,963,848, Cl. 335-172.000.

Squatrito, Joseph. Cushion wrap paper for permanent wave hairstyling and dispenser. 4,962,775, Cl. 132-222.000.

Squennis Pty. Ltd.: *See—*
Williams, John M., 4,962,935, Cl. 273-411.000.

Squitieri, Vincent: *See—*
Broderick, John; Jones, Peter; and Squitieri, Vincent, 4,963,705, Cl. 200-86.00R.

SRI International: *See—*
Avery, Mitchell A.; and Jennings-White, Clive, 4,963,683, Cl. 546-63.000.

Srour, Nassy; and Scanlon, Michael V., to United States of America, Army. Acoustic detection system. 4,964,100, Cl. 367-178.000.

SSMC Inc.: *See—*
Komori, Norio, 4,962,714, Cl. 112-287.000.
Sotome, Kenichi; and Nagasaki, Munetaka, 4,962,712, Cl. 112-121.260.

Stacey, Eric J., to Westinghouse Electric Corp. Wide bandwidth phase locked loop circuit with sliding window averager. 4,963,839, Cl. 331-17.000.

Stadler, Robert L.: *See—*
Ficken, Leonard A.; and Stadler, Robert L., 4,962,867, Cl. 221-130.000.

Stafford, Trevor G.: *See—*
Dickinson, Alan J.; and Stafford, Trevor G., 4,963,421, Cl. 428-36.900.

Stager, Joseph E.: *See—*
Nottelmann, Donald A.; Wallace, Norman G.; and Stager, Joseph E., 4,962,806, Cl. 164-112.000.

Stahlecker, Gerd; and Hofstetter, Klaus. Tangential belt drive for a spinning or twisting machine and method of operating same. 4,962,633, Cl. 57-105.000.

Stalter, Robert J., Sr.; and Prueter, Albert H., to Motor Wheel Corporation. Composite metal-elastomer styled wheels and method and apparatus for molding the same. 4,963,083, Cl. 425-125.000.

Stamicarbon B.V.: *See—*
Scholtens, Boudewijn J. R.; and Rutten, Hendrikus J. J., 4,963,299, Cl. 264-22.000.

Standard Oil Company, The: *See—*
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Stanich, Mikel J.: *See—*
Budd, Russell A.; Goddard, Joan S.; and Stanich, Mikel J., 4,963,900, Cl. 346-160.000.

Stansfeld, James W.; and Atkinson, David I. H., to Schlumberger Industries Limited. Single vibrating tube transducers. 4,962,671, Cl. 73-861.370.

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Bibbee, Russell S.; and Stearns, Robert E., 4,963,400, Cl. 427-374.100.

Steele, John: *See—*
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Steen, Conrad, to J. M. Voith GmbH. Headbox having Coanda nozzle for mixing slurry therein. 4,963,228, Cl. 162-344.000.

Steer, Peter L.; and Wiltshire, Neil P., to E. R. Squibb & Sons, Inc. Coupling for attaching an ostomy or pouch to a medical grade adhesive pad. 4,963,136, Cl. 604-339.000.

Steeves, John L.: *See*—
Honickman, Aline M.; Steeves, John L.; Higgins, Michael A.; and Frary, Anna M., 4,964,067, Cl. 364-520.000.

Stefan, Michael S., to Baxter International Inc. Suture loop for catheters. 4,962,757, Cl. 128-.26..

Stehle, Heinz; Weidinger, Hans; Steinberg, Eckard; and Garzarolli, Friedrich, to Siemens Aktiengesellschaft. Fuel rod for a nuclear reactor fuel assembly. 4,963,316, Cl. 376-416.000.

Steidl, Dieter: *See*—
Bochmann, Klaus; Risto, Hans-Joachim; Volker, Wolfgang; Gursky, Helmut; and Steidl, Dieter, 4,962,893, Cl. 241-5.000.

Stein, Howard E.: *See*—
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Stein, Jerry Y.: *See*—
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Steinberg, Eckard: *See*—
Stehle, Heinz; Weidinger, Hans; Steinberg, Eckard; and Garzarolli, Friedrich, 4,963,316, Cl. 376-416.000.

Steiner, Ulrich A.: *See*—
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Steinhardt, Hauke: *See*—
Ruback, Wulf; Schut, Jan; Friedrich, Werner; Riemer, Heinz; and Steinhardt, Hauke, 4,963,274, Cl. 252-8.750.

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Ingermann, Donald E.; Smith, Ronald L.; Caffrey, Stephen F.; and Steinhoff, Lonney J., 4,962,565, Cl. 15-302.000.

Steinke, Leo: *See*—
Benedikt, Walter; Friese, Karl-Hermann; Herden, Werner; Schuldt, Dietrich; and Steinke, Leo, 4,963,112, Cl. 445-7.000.

Steketee, Sherwood: *See*—
DeHaan, Daniel; Brinks, Michael J.; and Steketee, Sherwood, 4,963,255, Cl. 210-230.000.

Stellberger, Rudi: *See*—
D'Heureuse, Walter; Kusch, Hans-Jurgen; Heppenstiel, Gerhard; and Stellberger, Rudi, 4,962,705, Cl. 101-148.000.

Stenmisk, Incorporated: *See*—
Engdahl, Lawrence W.; and Stein, Howard E., 4,962,780, Cl. 135-20.00R.

Sterling Drug Inc.: *See*—
Fuggini, Cynthia L.; and Streit, Allan L., 4,963,432, Cl. 428-290.000.
Lesher, George Y.; Bacon, Edward R.; Singh, Baldev; and Kuo, Gee-Hong, 4,963,561, Cl. 514-303.000.

Sterling, Thomas L.; and Chan, Ellery Y., to Harris Corporation. Static dataflow computer with a plurality of control structures simultaneously and continuously monitoring first and second communication channels. 4,964,042, Cl. 364-200.000.

Stern, Richard J.; and Kempiak, Donald J., to Associated Mills Inc. Air bubbling mats having heated air for therapeutically agitating bath water. 4,962,759, Cl. 128-66.000.

Sternglass, Daniel, to Databook, Inc. Voltage transient protection circuit. 4,964,011, Cl. 361-88.000.

Sternling, Charles V., to Shell Oil Company. Coal gasification process. 4,963,162, Cl. 48-203.000.

Stetsovich, Viktor I.: *See*—
Goldovsky, Viktor L.; Stetsovich, Viktor I.; and Zayats, Andrei J., 4,963,023, Cl. 356-308.000.

Stewart, Charles W.: *See*—
Anderson, Jerrel C.; Gangal, Subhash V.; Kerbow, Dewey L.; and Stewart, Charles W., 4,963,609, Cl. 524-413.000.

Stewart, John V. Sidewalk lifter. 4,962,913, Cl. 254-269.000.

Stewart, Roger G., to General Electric Company. Integrated matrix display circuitry. 4,963,860, Cl. 340-719.000.

Steyr-Daimler-Puch AG: *See*—
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Stichting Rega VZW (REGA): *See*—
de Clercq, Erik D. A.; Herdewijn, Piet A. M. M.; Broder, Samuel; and Balzarini, Jan M. R., 4,963,533, Cl. 514-49.000.

Stock, Werner: *See*—
Mattes, Ralf; Lenz, Helmut; and Stock, Werner, 4,963,469, Cl. 435-7.000.

Stockel, Ivar H., to University of Maine, The Board of Trustees of the. High flow rate nozzle system with production of uniform size droplets. 4,962,886, Cl. 239-11.000.

Stockton, Gerald W.; Chidester, Dale H.; and Ehrlich, Susan J., to American Cyanamid Company. Method for the calorimetry of chemical processes. 4,963,499, Cl. 436-147.000.

Stockton, Warren D.: *See*—
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Stoehrer, Bernhard: *See*—
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Stokley, Alan G.: *See*—
Krishnamurthy, Ramachandran; Malik, Virginia A.; and Stokley, Alan G., 4,963,339, Cl. 423-437.000.

Stoll, Kurt, to Festo KG. Rate of flow control valve. 4,962,912, Cl. 251-208.000.

Stone, Darryl L.: *See*—
Sinor, Lyle T.; Eatz, Ralph A.; Stone, Darryl L.; and Plapp, Fred V., 4,963,478, Cl. 435-7.000.

Stork Screens B.V.: *See*—
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Stout, David M.: *See*—
Schoenleber, Robert W.; Kebabian, John W.; Martin, Yvonne C.; DeNinno, Michael P.; Perner, Richard J.; Stout, David M.; Hsiao, Chi-Nung W.; DiDomenico, Stanley, Jr.; DeBernardis, John F.; Basha, Fatima Z.; Meyer, Michael D.; and De, Biswanath, 4,963,568, Cl. 514-320.000.

Stowe, Harold A.: *See*—
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Stowell Davin; and Gerth, Jean M., to Smart Design, Inc. Multipurpose container toy with mountable wheels. 4,963,115, Cl. 446-96.000.

Strack, Joerg: *See*—
Schlosser, Hans-Joachim; and Strack, Joerg, 4,963,472, Cl. 430-303.000.

Stralow, Cecil J. Beverage can crusher. 4,962,701, Cl. 100-215.000.

Streeter, Stephanie A.: *See*—
Kao, Kim Y.; and Streeter, Stephanie A., 4,962,603, Cl. 40-641.000.

Strehlow, Robert W., to McNeilus Truck and Manufacturing, Inc. Drum for tilt mixer. 4,963,032, Cl. 366-57.000.

Strein, Klaus: *See*—
Holck, Jens-Peter; Mertens, Alfred; Kampe, Wolfgang; Muller-Beckmann, Bernd; Sponer, Gisbert; and Strein, Klaus, 4,963,686, Cl. 546-273.000.

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Strekowski, Lucjan; Mokrosz, Maria; and Harden, Donald B., to Georgia State University Foundation, Inc. Di-substituted phthalazines. 4,963,676, Cl. 544-237.000.

Stromgren, Lawrence T.; and Kamau, George P., III, to Stromgren, Lawrence Thompson. Stirrup-lock ankle support. 4,962,768, Cl. 128-80.00H.

Stromgren, Lawrence Thompson: *See*—
Stromgren, Lawrence T.; and Kamau, George P., III, 4,962,768, Cl. 128-80.00H.

Strong, Bernard, to Pro Pak California. Container closure device. 4,962,872, Cl. 222-516.000.

Stuecker, Barry M. Light bulb shaped audio signal emitter. 4,963,854, Cl. 340-384.00E.

Stuivenwold, Armand M.; Van Lammeren, Johannes P. M.; van Elk, Henricus T. P. J.; and Motte, Bruno P. J. M., to U.S. Philips Corporation. Self adjusting frequency demodulating integrated circuit. 4,963,831, Cl. 329-318.000.

Stulberger, Peter: *See*—
Muncy, Charles W.; and Stulberger, Peter, 4,963,208, Cl. 156-145.000.

Su, Kai C.: *See*—
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Suda, Nobuo: *See*—
Matsuo, Yutaka; Suda, Yoshitaka; and Suda, Nobuo, 4,963,323, Cl. 420-422.000.

Suda, Yasuo; and Higashihara, Masaki, to Canon Kabushiki Kaisha. Camera apparatus having means for setting the position of an optical grating at a desired location in the viewfinder. 4,963,912, Cl. 354-404.000.

Suda, Yoshitaka: *See*—
Matsuo, Yutaka; Suda, Yoshitaka; and Suda, Nobuo, 4,963,323, Cl. 420-422.000.

Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG: *See*—
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Suga, Akira; and Takaiwa, Kan, to Canon Kabushiki Kaisha. Image sensing device. 4,963,980, Cl. 358-209.000.

Sugawara, Kiyoto: *See*—
Urushibata, Kenichi; Kojima, Keiichi; Sugawara, Kiyoto; and Saen, Haruo, 4,963,699, Cl. 174-88.00R.

Sugaya, Nobuyasu; Kondo, Munetaka; Murashita, Kikuji; and Kobayashi, Motoi, to NKK Corporation. Apparatus for inspecting a pipeline. 4,964,059, Cl. 364-507.000.

Sugaya, Toshihiro: *See*—
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Sugden, Kenneth B., to Sundstrand Corporation. Oil management tank system. 4,962,829, Cl. 184-6.230.

Sugimoto, Tadao; and Yoneyama, Masakazu, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 4,963,476, Cl. 430-574.000.

Sugimura, Hiroshi: *See*—
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Sugino, Yoichiro: *See*—
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Sugiura, Yumiko: *See*—
Kumano, Akira; Sugiura, Yumiko; and Aoyama, Chiaki, 4,964,044, Cl. 364-419.000.

Sugiyama, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Starter for engine. 4,963,760, Cl. 290-48.000.

Sugiyama, Tsuyoshi: *See*—
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Sujita, Shigeko: *See*—
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Sulc, Jiri ; and Krcova, Zuzana, to Ceskoslvnska akademie ved. Intraocular optical system. 4,963,148, Cl. 623-6.000.
Sulzer Brothers Limited: *See*—
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Noesberger, Bruno; and Frey, Otto, 4,963,153, Cl. 623-20.000.
Sumihara, Masanori; Imasaka, Yoshinobu; and Yoneno, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Ultrasonic motor. 4,963,781, Cl. 310-323.000.
Sumika Chemical Analysis Service: *See*—
Oi, Naobumi; Kitahara, Hajimu; and Doi, Tadashi, 4,963,254, Cl. 210-198.200.
Sumitomo Cement Co., Ltd.: *See*—
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Sumitomo Chemical Company, Limited: *See*—
Fukui, Yoshiharu; Kuroda, Kazuhisa; Ishii, Tamaki; and Sasaki, Manji, 4,963,605, Cl. 524-108.000.
Oi, Naobumi; Kitahara, Hajimu; and Doi, Tadashi, 4,963,254, Cl. 210-198.200.
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Urushibata, Kenichi; Kojima, Keiichi; Sugawara, Kiyoto; and Saen, Haruo, 4,963,699, Cl. 174-88.00R.
Sumitomo Forestry Co., Ltd.: *See*—
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Sumitomo Heavy Industries. Ltd.: *See*—
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Sumitomo Metal Industries, Ltd.: *See*—
Okuda, Takanari; Nomura, Shigeo; Shibahara, Itaru; Enokido, Yuji; Fujiwara, Masayuki; Nishida, Toshio; Teranishi, Hiroshi; Hirano, Susumu; Iseda, Aturou; and Nakajima, Motoharu, 4,963,200, Cl. 148-325.000.
Sumitomo Naugatuck Co., Ltd.: *See*—
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Sumitomo Pharmaceuticals Company, Limited: *See*—
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Sundstrand Corporation: *See*—
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Sung, Eric: *See*—
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Sunohara, Tadaomi: *See*—
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Supernaw, Irwin R.: *See*—
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Surgin Surgical Instrumentation, Inc.: *See*—
Wortrich, Theodore S., 4,963,131, Cl. 604-34.000.
Souronen, David E., to Gould. Inc. Electric fuse. 4,962,977, Cl. 337-244.000.
Suzuki, Akira: *See*—
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Suzuki, Hideo; and Sakama, Masao, to Yamaha Corporation. Musical tone generation control apparatus. 4,962,688, Cl. 84-600.000.
Suzuki, Hideto: *See*—
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Suzuki, Hiroshi: *See*—
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Suzuki, Hitoshi; Shiotani, Shinobu; Tokunaga, Shinji; Hirai, Tokuyuki; Fukumochi, Yoji; Kugimiya, Shuzo; and Sata, Ichiko, to Sharp Kabushiki Kaisha. Apparatus for translating sentences containing punctuation marks. 4,964,030, Cl. 364-419.000.
Suzuki, Ikuo; Yoneda, Takao; Tsujiuchi, Toshio; and Arimoto, Naoki, to Toyoda Koki Kabushiki Kaisha. Numerical control apparatus for machining non-circular workpieces. 4,963,805, Cl. 318-569.000.
Suzuki Jidosha Kogyo Kabushiki Kaisha: *See*—
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Suzuki, Noriyuki; and Asai, Hironobu, to Ando Electric Co., Ltd. In-circuit emulator. 4,964,074, Cl. 364-900.000.
Suzuki, Seiichi, to JEOL Ltd. Transmission electron microscope. 4,963,737, Cl. 250-311.000.
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Suzuki, Shigeru: *See*—
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Suzuki, Tadao, to Sanofi. Method of treating cancer and cancer metastasis. 4,963,559, Cl. 514-301.000.
Suzuki, Takanori: *See*—
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Suzuki, Toshio: *See*—
Hara, Shigeo; Sekine, Setsuo; Suzuki, Toshio; Taguchi, Minoru; Mitsuoka, Akio; and Tetsu, Yoshiyuki, 4,963,435, Cl. 428-379.000.
Suzuki, Yasuzo: *See*—
Ichimura, Kunihiro; Suzuki, Yasuzo; Seki, Takahiro; Sakuragi, Masako; Tamaki, Takashi; Hosoki, Akira; and Aoki, Koso, 4,963,448, Cl. 430-20.000.
Svagr, Alexander, to SMS Schloemann-Siemag Aktiengesellschaft. Rolling mill train, particularly rolling mill train in a section mill. 4,962,657, Cl. 72-238.000.
Swan, George A., III: *See*—
Baird, William C., Jr.; Riley, Kenneth L.; and Swan, George A., III, 4,963,249, Cl. 208-139.000.
Swann, Thomas A., to Optomec Design Company. Termination interface structure and method for joining an optical fiber to a graded index rod lens. 4,962,988, Cl. 350-96.180.
Swiderski, Kevin J.: *See*—
Wiatt, James G.; Swiderski, Kevin J.; Belcher, Samuel L.; and Smith, Roger D., 4,963,086, Cl. 425-526.000.
Syldatk, Andreas: *See*—
Beaujean, Hans-Josef; Eisenblaetter, Horst; Fues, Johann F.; Giesen, Brigitte; Holz, Erich; Jahnke, Ulrich; Kuenzel, Werner; Meffert, Alfred; Schwadtke, Karl; Smulders, Eduard; Sung, Eric; Syldatk, Andreas; Toelken, Hans-Georg; and Wegener, Ingo, 4,963,158, Cl. 8-137.000.
Syntex (U.S.A.) Inc.: *See*—
Olson, John D., 4,963,468, Cl. 435-7.000.
Synthelabo: *See*—
Manoury, Philippe; Binet, Jean; Obitz, Daniel; Defosse, Gerard; Dewitte, Elisabeth; and Veronique, Corinne, 4,963,680, Cl. 544-395.000.
Synthetic Blood Corporation: *See*—
Ecanow, Bernard, 4,963,526, Cl. 514-3.000.
Synthetic Products Company: *See*—
Grossman, Richard F.; and Tanno, David M., 4,963,127, Cl. 556-106.000.
Systems, Inc.: *See*—
Gelder, Kenneth M., 4,963,068, Cl. 414-401.000.
Szabolcsi, Tamas: *See*—
Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo ; Soos, Ruldof; Radvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, 4,963,584, Cl. 514-521.000.
Szekely, Istvan: *See*—
Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo ; Soos, Ruldof; Radvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, 4,963,584, Cl. 514-521.000.
Szentivanyi, Zsolt; Obrecht, Werner; and Wassen, Jurgen, to Bayer Aktiengesellschaft. Cross-linkable mixtures based on hydrogenated nitrile rubber and ethylene/acrylonitrile copolymers. 4,963,621, Cl. 525-207.000.
Szilagyi, Miklos N., to Arizona Technology Development Corporation (ATDC). Composite multipurpose multipole electrostatic optical structure and a synthesis method for minimizing aberrations. 4,963,748, Cl. 250-396.00R.
T. O. Plastics, Inc.: *See*—
Holmquist, Marlon E., 4,962,855, Cl. 206-423.000.
Tachi, Katsuichi: *See*—
Takayama, Jun; Tachi, Katsuichi; Suzuki, Hideto; and Masuzaki, Kenshiro, 4,963,868, Cl. 341-72.000.
Taft, Jeffrey D.: *See*—
Drisko, Robert A.; and Taft, Jeffrey D., 4,963,036, Cl. 382-50.000.
Tagawa, Akihiko: *See*—
Hangai, Toshimasa; Ishitoya, Koichi; and Tagawa, Akihiko, 4,964,111, Cl. 369-215.000.
Taguchi, Minoru: *See*—
Hara, Shigeo; Sekine, Setsuo; Suzuki, Toshio; Taguchi, Minoru; Mitsuoka, Akio; and Tetsu, Yoshiyuki, 4,963,435, Cl. 428-379.000.
Tagusa, Yasunobu; Matsubara, Hiroshi; and Nukii, Takashi, to Sharp Kabushiki Kaisha. Connection construction and method of manufacturing the same. 4,963,002, Cl. 350-336.000.
Tahara, Yoshifumi: *See*—
Horiuchi, Takao; Arai, Izumi; and Tahara, Yoshifumi, 4,963,713, Cl. 219-121.430.
Tai, David. Dual direction transmission device of a video cassette rewinder. 4,962,899, Cl. 242-201.000.

Tainaka, Masahiro: *See*—
Aramaki, Minoru; Nakagawa, Shinsuke; Nakano, Hisaji; Ichimura, Hiroshi; and Tainaka, Masahiro, 4,964,137, Cl. 372-59.000.
Taisho Pharmaceutical Co., Ltd.: *See*—
Katunuma, Nobuhiko, 4,963,654, Cl. 530-324.000.
Tajima, Akio; and Ishii, Katsumi, to Matsushita Electric Industrial Co., Ltd. Thermal sensing system. 4,964,115, Cl. 374-109.000.
Tajima, Keiichi: *See*—
Shibata, Hiromi; Takahashi, Kazuki; Tajima, Keiichi; Kurita, Takashi; Wada, Kiyoshi; and Yamashita, Kiyoshi, 4,963,794, Cl. 315-81.000.
Tajima, Tomoyuki, to Koken Ltd.; Oishi, Tadakatsu; Nagasu, Youichiro; and Yamaguchi, Hisao. Agent for inhibiting proliferation of human malignant tumor cells. 4,963,358, Cl. 424-548.000.
Takada, Akihiro: *See*—
Onishi, Kunihiro; Takada, Akihiro; and Sakamoto, Kaneyuki, 4,963,926, Cl. 355-203.000.
Takada, Masaaki: *See*—
Adachi, Takuya; Ito, Sukenori; Shiosaka, Akihiro; Yuzawa, Atsushi; Takada, Masaaki; Okano, Kiichiro; Kurihara, Masaru; and Uchiyama, Hiromitsu, 4,963,335, Cl. 422-302.000.
Takada, Mitsuyuki; Tsukao, Ryusaku; and Takasago, Hayato, to Mitsubishi Denki Kabushiki Kaisha. Method for producing hybrid integrated circuit substrate. 4,963,389, Cl. 427-98.000.
Takada, Yoshihiro: *See*—
Fujioka, Keiji; Sato, Shigeji; and Takada, Yoshihiro, 4,963,529, Cl. 514-12.000.
Takagi, Masami; and Aoyagi, Masahiko, to Toshiba Lighting & Technology Corporation. Fluorescent lamp unit. 4,963,785, Cl. 313-318.000.
Takagi, Nobuyuki: *See*—
Moriya, Kazunori; Takagi, Nobuyuki; Sugaya, Toshihiro; and Nakamura, Norio, 4,964,009, Cl. 360-135.000.
Takagi, Shigehide; and Yamauchi, Shigeru, to Sumitomo Cement Co., Ltd. Porous ceramic material and processes for preparing same. 4,963,145, Cl. 606-76.000.
Takagi, Shinji: *See*—
Sekiguchi, Atsushi; Kobayashi, Tsukasa; and Takagi, Shinji, 4,963,423, Cl. 428-209.000.
Takagi, Shiro: *See*—
Izawa, Koji; Takagi, Shiro; and Kamiyama, Tadanobu, 4,964,039, Cl. 364-200.000.
Takagi, Yasuji: *See*—
Sonoda, Yoshihide; Takagi, Yasuji; and Ishigaki, Kouji, 4,963,938, Cl. 355-260.000.
Takagi, Yuji: *See*—
Satoh, Isao; Ichinose, Makoto; Fukushima, Yoshihisa; Kuroki, Yuzuru; Takagi, Yuji; and Azumatani, Yasushi, 4,964,094, Cl. 369-59.000.
Takahashi, Hidenaga: *See*—
Kohiyama, Kiyoshi; and Takahashi, Hidenaga, 4,963,817, Cl. 324-83.00D.
Takahashi, Isao; and Iwata, Makoto, to Sanken Electric Co., Ltd.; and Isao Takahashi. A.C. motor drive method and apparatus for precision positional control. 4,962,976, Cl. 318-81.000.
Takahashi, Kazuki: *See*—
Shibata, Hiromi; Takahashi, Kazuki; Tajima, Keiichi; Kurita, Takashi; Wada, Kiyoshi; and Yamashita, Kiyoshi, 4,963,794, Cl. 315-81.000.
Takahashi, Norio: *See*—
Nishiike, Ujihiro; Kobayashi, Yasuhiro; Ishitobi, Hirotake; Sujita, Shigeko; Takahashi, Norio; Nakahara, Hisanao; and Inokuti, Yukio, 4,963,197, Cl. 148-111.000.
Takahashi, Ryuichi; and Yabuki, Yoshiharu, to Fuji Photo Film Co., Ltd. Light-sensitive micropcapsule and light-sensitive material employing the same. 4,963,461, Cl. 430-138.000.
Takahashi, Tokuyuki; Kubo, Seitoku; Itoh, Hiroshi; and Fukai, Masayuki, to Toyota Jidosha Kabushiki Kaisha. Planetary gear transmission for motor vehicle. 4,963,124, Cl. 475-278.000.
Takahashi, Toru: *See*—
Sato, Hisashi; Nishio, Yukio; Hayashi, Hideharu; Yamamoto, Masaki; and Takahashi, Toru, 4,963,099, Cl. 439-76.000.
Takai, Ryuzo; and Miyadai, Masao, to Shiga Prefecture. Light-storing glazes and light-storing fluorescent ceramic articles. 4,963,441, Cl. 428-690.000.
Takaiwa, Kan: *See*—
Suga, Akira; and Takaiwa, Kan, 4,963,980, Cl. 358-209.000.
Takakura, Masaki: *See*—
Yamane, Yasukuni; Kako, Noritoshi; Noguchi, Yoji; and Takakura, Masaki, 4,964,066, Cl. 364-518.000.
Takamatsu, Yukishige: *See*—
Sato, Mitsuo; Aoki, Toshikazu; Takamatsu, Yukishige; and Ryoke, Hideyasu, 4,963,639, Cl. 528-72.000.
Takami, Osamu, to Kabushiki Kaisha Toshiba. Electronic endoscope apparatus employing automatic light source control. 4,963,960, Cl. 358-98.000.
Takanashi, Kenichi, to Ricoh Company, Ltd. Light beam scanning device and light beam scanning lens. 4,962,982, Cl. 350-6.800.
Takaoka, Yasuhiro: *See*—
Saito, Yuji; Yamada, Kazuo; Inoue, Akiyoshi; and Takaoka, Yasuhiro, 4,962,578, Cl. 29-132.000.
Takasago, Hayato: *See*—
Takada, Mitsuyuki; Tsukao, Ryusaku; and Takasago, Hayato, 4,963,389, Cl. 427-98.000.
Takata Corporation: *See*—
Kokeguchi, Akira, 4,963,412, Cl. 428-137.000.
Takayama, Jun; Tachi, Katsuichi; Suzuki, Hideto; and Masuzaki, Kenshiro, to Sony Corporation. Frame synchronizing method and system. 4,963,868, Cl. 341-72.000.
Takayama, Jun: *See*—
Isoguchi, Seiichi; Murai, Yoshio; Takayama, Jun; and Nagaishi, Katsuya, 4,963,985, Cl. 358-227.000.
Takebayashi, Hiroaki; Yamauchi, Kouichi; and Naruse, Koji, to Koyo Seiko Co., Ltd. Heat-resistant ball bearing. 4,963,040, Cl. 384-492.000.
Takeda Chemical Industries, Ltd.: *See*—
Kanamaru, Tsuneo; Ishimaru, Takenori; and Muroi, Masayuki, 4,963,581, Cl. 514-455.000.
Numata, Mitsuo; Minamida, Isao; and Tsushima, Susumu, 4,963,542, Cl. 514-206.000.
Sasaki, Ichiro; Oshima, Junji; and Yamada, Minoru, 4,963,618, Cl. 525-67.000.
Takei, Hajime: *See*—
Murasaki, Sadanobu; and Takei, Hajime, 4,963,896, Cl. 346-134.000.
Takei, Norio. Lining laminate for a pipeline. 4,962,958, Cl. 285-55.000.
Takemiya, Akinori: *See*—
Kishii, Ryuji; and Takemiya, Akinori, 4,963,085, Cl. 425-385.000.
Takenaga, Kiyomasa: *See*—
Yamauchi, Yasuhiro; Arakawa, Yoshihisa; Fujima, Yukihita; Takenaga, Kiyomasa; and Hino, Hirokazu, 4,962,711, Cl. 110-347.000.
Takenouchi, Masanori: *See*—
Harada, Toshiaki; Yamamoto, Tadashi; and Takenouchi, Masanori, 4,963,895, Cl. 346-108.000.
Takeshita, Kazuyuki: *See*—
Doi, Nobukazu; Eto, Yoshizumi; Izumita, Morishi; Mita, Seiichi; and Takeshita, Kazuyuki, 4,963,992, Cl. 358-335.000.
Takeuchi, Satoshi, to Dai Nippon Insatsu Kabushiki Kaisha. Method of storing a consumed amount in a card memory. 4,963,722, Cl. 235-382.500.
Takeuchi, Yasuhisa: *See*—
Tanaka, Hiroshi; Etoh, Yohsiyuki; and Takeuchi, Yasuhisa, 4,964,048, Cl. 364-426.040.
Takida, Hiroshi: *See*—
Kunieda, Makoto; and Takida, Hiroshi, 4,963,608, Cl. 524-394.000.
Takizawa, Takashi; Ohshimizu, Kiyoshi; Aoki, Ken; Nakano, Hirotaka; and Kuribara, Hiroyuki, to Sanyo Electric Co., Ltd. Refrigeration apparatus. 4,962,648, Cl. 62-199.000.
Talmadge, James E.: *See*—
Shepard, H. Michael; and Talmadge, James E., 4,963,354, Cl. 424-85.100.
Tam, Wilson: *See*—
Anderson, Albert G.; Eaton, David F.; Tam, Wilson; and Wang, Ying, 4,962,979, Cl. 350-1.100.
Tamagawa Seiki Kabushiki Kaisha: *See*—
Mori, Hidetoshi, 4,963,775, Cl. 310-49.00R.
Tamai, Yasuo: *See*—
Ogawa, Hiroshi; Tamai, Yasuo; and Kawamata, Toshio, 4,963,433, Cl. 428-323.000.
Tamaki, Ryoichi: *See*—
Mizunuma, Tatsuya; Tamaki, Ryoichi; Kanzaki, Shoji; Tanisho, Yoshiaki; and Yamato, Fuzio, 4,963,190, Cl. 106-724.000.
Tamaki, Takashi: *See*—
Ichimura, Kunihiro; Suzuki, Yasuzo; Seki, Takahiro; Sakuragi, Masako; Tamaki, Takashi; Hosoki, Akira; and Aoki, Koso, 4,963,448, Cl. 430-20.000.
Tamaoki, Yoshikatsu: *See*—
Nishizawa, Junichi; and Tamaoki, Yoshikatsu, 4,964,023, Cl. 362-100.000.
Tamary, Ernest J., to Eastman Kodak Company. Fusing apparatus having a heat-dissipating device. 4,963,943, Cl. 355-290.000.
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, to Nissan Motor Co., Ltd. Machine for holding workpiece. 4,962,917, Cl. 269-56.000.
Tamura, Minoru: *See*—
Iwata, Toru; Katayose, Shinji; and Tamura, Minoru, 4,964,045, Cl. 364-426.020.
Tanabe Seiyaku Co., Ltd.: *See*—
Iwakuma, Takeo; Sekine, Yasuo; Sasaki, Yasuhiko; Ikezawa, Katsuo; and Odawara, Akio, 4,963,587, Cl. 514-562.000.
Samejima, Masayoshi; Noda, Kazuo; Kobayashi, Masao; and Ishikawa, Shigeyuki, 4,963,365, Cl. 424-46.00L.
Tanaka, Eishi; Nishizawa, Tsutomu; and Yamada, Yasuyuki, to Mitsui Toatsu Chemicals, Incorporated. P-amino substituted tetraphenylthiophenes and electrophotographic photoreceptors containing them. 4,963,449, Cl. 430-59.000.
Tanaka, Hirokazu: *See*—
Okamoto, Masanori; Tsujii, Eisaku; Kaizu, Tsutomu; Hatanaka, Hiroshi; Okuhara, Masakuni; Sawada, Kozo; and Tanaka, Hirokazu, 4,963,585, Cl. 514-529.000.
Tanaka, Hiroshi; Etoh, Yohsiyuki; and Takeuchi, Yasuhisa, to Nissan Motor Company, Limited. System and method for automatically controlling vehicle speed to desired cruise speed. 4,964,048, Cl. 364-426.040.
Tanaka, Hiroshi: *See*—
Yato, Tadao; Tanaka, Hiroshi; Kikuchi, Toshiaki; and Onoshita, Toshio, 4,963,294, Cl. 252-636.000.
Tanaka, Keiji: *See*—
Sato, Kazuo; Yanai, Toshiaki; Kinoto, Takao; Tanaka, Keiji; Nishida, Akira; Toyama, Toshimitsu; Frei, Bruno; and O'Sullivan, Anthony, 4,963,582, Cl. 514-450.000.
Tanaka, Kenichi: *See*—
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Tanaka, Makoto: *See*—
Nagai, Yoshitaka; Shibayama, Shohei; Numata, Masaaki; Yoshimura, Shoji; Tanaka, Makoto; Ito, Masayoshi; Awaya, Akira; Kobayashi, Hisashi; Abe, Hayao; Ishizuka, Yusaku; and Ogawa, Tomoya, 4,963,653, Cl. 530-322.000.

Tanaka, Shiro: *See*—
Nakagawa, Takahiro; and Tanaka, Shiro, 4,963,387, Cl. 426-649.000.

Tanaka, Sueyosi: *See*—
Sakai, Kunito; Tanaka, Sueyosi; Tutumi, Yasutugu; and Morita, Yutaka, 4,963,307, Cl. 264-102.000.

Tanaka, Yoshihiro; Tsuji, Sadafusa; Hata, Yoshiaki; Inoue, Manabu; Ootsuka, Hiroshi; Iwata, Michihiro; Ishito, Fumiaki; and Hayama, Koh, to Minolta Camera Kabushiki Kaisha. Photographic camera. 4,963,916, Cl. 354-435.000.

Tang, Thomas E.: *See*—
Teng, Clarence W.; Tang, Thomas E.; and Wei, Che-Chia, 4,963,502, Cl. 437-41.000.

Tange, Keigo, to Minolta Camera Kabushiki Kaisha. Residual toner cleaning device for image forming apparatus. 4,963,944, Cl. 355-298.000.

Tange, Toshiyuki: *See*—
Etoh, Hideyuki; Shida, Kozo; Tange, Toshiyuki; and Shiotani, Yoshio, 4,963,712, Cl. 219-86.900.

Tani, Katsuya: *See*—
Mitamura, Hideyuki; Arimatsu, Yoshikazu; Tani, Katsuya; and Katsuo, Kenichi, 4,963,310, Cl. 264-205.000.

Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Tsuji, Kenji; Omaki, Takanobu; and Makai, Masaaki, to Minolta Camera Kabushiki Kaisha. Flash photographing system. 4,963,914, Cl. 354-413.000.

Taniguchi, Nobuyuki; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; Hoda, Takeo; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Photographic camera. 4,963,917, Cl. 354-484.000.

Taniguchi, Nobuyuki: *See*—
Inoue, Manabu; Taniguchi, Nobuyuki; Hata, Yoshiaki; Hoda, Takeo; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,963,907, Cl. 354-222.000.

Taniguchi, Takashi; Kurasaki, Shoichi; and Oka, Koichiro, to Toray Industries, Inc. Pressure-sensitive tablet. 4,963,417, Cl. 428-327.000.

Tanimura, Masashi: *See*—
Kawase, Mitsuru; Tanimura, Masashi; Terasawa, Hidekazu; Nakamura, Sohei; Nagano, Takayuki; Higashimori, Shosuke; Matsuki, Hiroshi; and Matsumoto, Hisashi, 4,963,230, Cl. 162-129.000.

Tanisho, Yoshiaki: *See*—
Mizunuma, Tatsuya; Tamaki, Ryoichi; Kanzaki, Shoji; Tanisho, Yoshiaki; and Yamato, Fuzio, 4,963,190, Cl. 106-724.000.

Tankovitz, Oskar T.: *See*—
Miller, Robert G.; MacKillop, Duncan A.; and Tankovitz, Oskar T., 4,963,623, Cl. 525-237.000.

Tanno, David M.: *See*—
Grossman, Richard F.; and Tanno, David M., 4,963,127, Cl. 556-106.000.

Taoka, James T.: *See*—
Pisors, George L.; and Taoka, James T., 4,962,847, Cl. 198-643.000.

Tappe, Horst; Oehme, Dieter; Schlafer, Ludwig; and Russ, Werner H., to Hoechst Aktiengesellschaft. Water soluble naphthylazopyrazolone dyestuffs having fiber-reactive groups of the vinylsulfone series. 4,963,661, Cl. 534-642.000.

Tash, George; and Hartmann, Warren. Water pressure operated water pump. 4,963,073, Cl. 417-181.000.

Tatsumi, Takumi: *See*—
Murano, Katsuaki; Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 4,962,678, Cl. 74-844.000.

Taub, Rae: *See*—
Chiu, Shuet-Hing L.; Carlin, Josephine R.; and Taub, Rae, 4,963,667, Cl. 536-7.100.

Taue, Jun: *See*—
Matsuo, Noritaka; Taue, Jun; and Miyazawa, Kazuo, 4,962,736, Cl. 123-257.000.

Taylor, Alva R. Fence. 4,962,914, Cl. 256-72.000.

Taylor, Carl R.: *See*—
Chapin, J. Thomas; Hardee, Addison G., Jr.; Larseon-Moss, Lisa M.; Leshe, Charles M.; Overton, Bob J.; Shea, John W.; Taylor, Carl R.; and Turnipseed, John M., 4,962,992, Cl. 350-96.230.

Taylor, James B.: *See*—
Antrim, Richard L.; Lloyd, Norman E.; and Taylor, James B., 4,963,368, Cl. 424-498.000.
Antrim, Richard L.; and Taylor, James B., 4,963,385, Cl. 426-602.000.

Taylor, John C. Game apparatus. 4,962,934, Cl. 273-249.000.

Taylor, John W., Jr.; Enstrom, Richard A.; and LoBrutto, Antonio, to Westinghouse Electric Corp. Single-scan editor of bird echoes. 4,963,888, Cl. 342-90.000.

Taylor, Raymond L.: *See*—
Goela, Jitendra S.; Jaworski, Roy D.; and Taylor, Raymond L., 4,963,393, Cl. 427-248.100.

Tchen, Paul, to Institut National de la Sante et de la Researche Medicale; and Institut Pasteur. Probe containing a modified nucleic acid, recognizable by specific antibodies and use of this probe and theses specific antibodies to detect and characterize a homologous DNA sequence. 4,963,477, Cl. 435-6.000.

Technomed International: *See*—
Cathignol, Dominique; Lacruche, Bernard; and Mestas, Jean-Louis, 4,962,753, Cl. 128-24.00A.

Tedesco, Robert J.: *See*—
Grunert, Kurt A.; Cheski, Ronald A.; Tedesco, Robert J.; Whipple, Michael J.; Carrodus, Melvin A.; and Maloney, James G., 4,963,846, Cl. 335-42.000.

Teikoku Seiyaku Kabushiki Kaisha: *See*—
Kawazi, Toshikuni, 4,963,361, Cl. 424-443.000.

Tektronix, Inc.: *See*—
Janko, Bozidar; Sekulic, Zoran O.; and Bitetto, Mark F., 4,963,821, Cl. 324-158.00P.
Lehman-Lamer, Gail R., 4,963,225, Cl. 156-630.000.
Luthra, Ajay K.; and Messing, Dean, 4,963,020, Cl. 356-73.100.
Mallory, Robert L.; Basey, Gary D.; and Gainer, Robert L., 4,964,018, Cl. 361-391.000.
Orland, Steven; and Parish, Robert W., 4,963,967, Cl. 358-143.000.

Telefunken Electronic GmbH: *See*—
Beneking, Heinz, 4,963,947, Cl. 357-4.000.

Telemecanique: *See*—
Rosetti, Pierre; and Ribault, Yvette, 4,963,971, Cl. 357-37.000.

Telephone Cables Limited: *See*—
Jung, Roger E.; and Mills, Brian P., 4,962,989, Cl. 350-96.200.

Temple University of the Commonwealth System of Higher Education: *See*—
Pixley, Robin A., 4,963,657, Cl. 530-387.000.

Teng, Clarence W.; Tang, Thomas E.; and Wei, Che-Chia, to Texas Instruments, Incorporated. Method of making oxide-isolated source/drain transistor. 4,963,502, Cl. 437-41.000.

Teranishi, Hiroshi: *See*—
Okuda, Takanari; Nomura, Shigeo; Shibahara, Itaru; Enokido, Yuji; Fujiwara, Masayuki; Nishida, Toshio; Teranishi, Hiroshi; Hirano, Susumu; Iseda, Aturou; and Nakajima, Motoharu, 4,963,200, Cl. 148-325.000.

Teraoka, Masao, to Tochigifujisangyo Kabushiki Kaisha. Viscous coupling clutch. 4,962,837, Cl. 192-58.00C.

Terasawa, Hidekazu: *See*—
Kawase, Mitsuru; Tanimura, Masashi; Terasawa, Hidekazu; Nakamura, Sohei; Nagano, Takayuki; Higashimori, Shosuke; Matsuki, Hiroshi; and Matsumoto, Hisashi, 4,963,230, Cl. 162-129.000.

Terenko, Viktor V.: *See*—
Bokareva, Elvina Z.; Schinkorenko, Jelena V.; Terenko, Viktor V.; Nosova, Larisa A.; Faidel, Garri I.; Nurmuchomedov, Sijar N.; Beljakov, Anatolij V.; Vlasov, Ivan M.; Fuerst, Anton; Herrmann, Heinz; Pantzer, Eckart; Stoehrer, Bernhard; Uhland, Eberhard; and Werner, Hans, 4,963,650, Cl. 528-481.000.

Terlouw, Teunis: *See*—
Scott, Andrew M.; Quist, Bernardus B.; and Terlouw, Teunis, 4,963,065, Cl. 414-217.000.

Terrapin Technologies, Inc.: *See*—
Kauvar, Lawrence M., 4,963,263, Cl. 210-635.000.

Terumo Kabushiki Kaisha: *See*—
Naoi, Keiji; Iwata, Katsuhiko; and Kaneko, Osamu, 4,963,260, Cl. 210-446.000.

Tesch, Gunter. Quilted bed cover. 4,962,554, Cl. 5-502.000.

Tetley, William C.; Cummings, Bruce A.; and Westcott, Daniel R., to RAD-X Ltd. Radon progeny detector. 4,963,730, Cl. 250-253.000.

Tetsu, Yoshiyuki: *See*—
Hara, Shigeo; Sekine, Setsuo; Suzuki, Toshio; Taguchi, Minoru; Mitsuoka, Akio; and Tetsu, Yoshiyuki, 4,963,435, Cl. 428-379.000.

Teumac, Fred N.: *See*—
Ricciardi, Michael A.; and Teumac, Fred N., 4,963,593, Cl. 521-128.000.

Texaco Inc.: *See*—
Savage, Kerry D.; and Supernaw, Irwin R., 4,962,665, Cl. 73-155.000.

Texas Instruments Incorporated: *See*—
Kadakia, Shailesh R.; and Wilmoth, David D., 4,963,765, Cl. 307-443.000.
Peterson, Robert K.; Mowatt, Larry J.; and Poteet, Aaron D., 4,963,697, Cl. 174-252.000.
Roane, Bobby A., 4,963,510, Cl. 437-192.000.
Smith, Gregory C., 4,963,511, Cl. 437-192.000.
Teng, Clarence W.; Tang, Thomas E.; and Wei, Che-Chia, 4,963,502, Cl. 437-41.000.
Van Den Elst, Fredrik M. N.; and Velten, Hendrikus, 4,963,716, Cl. 219-202.000.

Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft: *See*—
Minichshofer, Klaus; Muller, Peter; and Pum, Hannes, 4,962,576, Cl. 28-110.000.

Textro, Inc.: *See*—
Nottelmann, Donald A.; Wallace, Norman G.; and Stager, Joseph E., 4,962,806, Cl. 164-112.000.

Th. Goldschmidt AG: *See*—
Ruf, Erich, 4,963,437, Cl. 428-432.000.
Weitemeyer, Christian; Wewers, Dietmar; and Jachmann, Juergen, 4,963,438, Cl. 428-447.000.

Thacker, Louis H., to United States of America, Energy. Ionizing radiation detector. 4,963,747, Cl. 250-388.000.

Thioulouse, Pascal; and Budin, Jean-Pierre, to Etat Francais represente par le Ministre des Postes et Telecommunications Centre National. Electroluminescent memory display having multi-phase sustaining voltages. 4,963,861, Cl. 340-781.000.

Thomas Jefferson University: *See*—
Osterholm, Jewell L., 4,963,130, Cl. 604-24.000.

Thomas, Paul R.; and Scott, William J., to Notepen, Inc. Note pen device. 4,963,048, Cl. 401-195.000.

Thomas, Richard D. Mold and dust inhibiting method and product. 4,963,366, Cl. 424-601.000.
Thomasson, James S.; Williams, Elwood L., Jr.; Bryant, Barry L.; Curtis, Cynthia H.; and Brown, Thomas W., to R. J. Reynolds Tobacco Company. Tobacco reconstitution process. 4,962,774, Cl. 131-309.000.
Thommen, Werner F., to U.S. Philips Corporation. Delay-controlled relaxation oscillator with reduced power consumption. 4,963,840, Cl. 331-111.000.
Thompson, Charles B.: *See—*
Wilkins, Charles H. T.; Hammack, Jack; and Thompson, Charles B., 4,963,280, Cl. 252-58.000.
Thompson, Darrow D. Adjustable protection shield for preventing coating overspray on a building's surface. 4,962,722, Cl. 118-504.000.
Thompson, Kevin D.: *See—*
Dempsey, Daniel J.; and Thompson, Kevin D., 4,962,749, Cl. 126-116.00A.
Thompson, Robert M., to W. L. Gore & Associates, Inc. Method to reduce the damage caused by ionizing radiation to polyurethane/porous expanded polytetrafluroethylene composites by use of hindered phenols. 4,963,416, Cl. 428-315.500.
Thomsen, Peter N. Cross-cutting method for bag filling machines. 4,962,797, Cl. 141-010.000.
Thomson-CSF: *See—*
Blanchard, Pierre; and Carquet, Michel, 4,963,953, Cl. 357-24.000.
Journeau, Remy, 4,964,165, Cl. 380-48.000.
Thomson Hybrides et Microondes: *See—*
Tung, Pham N., 4,963,873, Cl. 341-153.000.
Thoratec Laboratories Corporation: *See—*
Ward, Robert S.; and Riffle, Judy S., 4,963,595, Cl. 525-415.000.
Thorn EM plc: *See—*
Maufe, Barry G., 4,963,998, Cl. 360-60.000.
Thorn, Richard P., to Lord Corporation. Three-axis fluid-filled mount. 4,962,915, Cl. 267-140.100.
Thresh, Henry R.: *See—*
Wiencek, Thomas C.; Domagala, Robert F.; and Thresh, Henry R., 4,963,317, Cl. 376-422.000.
Throngnumchai, Kraisorn; and Murakami, Koichi, to Nissan Motor Company, Limited. Vertical MOSFET device having protector. 4,963,970, Cl. 357-23.400.
Thulke, Wolfgang: *See—*
Amann, Markus-Christian; Thulke, Wolfgang; and Baumann, Gerhard, 4,963,507, Cl. 437-130.000.
Thyssen Stahl Aktiegesellschaft: *See—*
Hoffken, Erich, 4,962,808, Cl. 164-476.000.
Tidwell, Richard R.; Geratz, Dieter J.; and Ohemeng, Kwasi A., to University of North Carolina at Chapel Hill, The. Methods for treating *Giardia lamblia*. 4,963,589, Cl. 514-636.000.
Tilders, Benno; and Leuchte, Michael, to Andreas Stihl. Portable handheld power-driven tool. 4,962,617, Cl. 51-170.0PT.
Timms, Graham H.: *See—*
Hotten, Terrence M.; Timms, Graham H.; and Tupper, David E., 4,963,558, Cl. 514-293.000.
Tioxide Group PLC: *See—*
Hinley, John J., 4,963,156, Cl. 8-94.290.
Titze, James R.: *See—*
Braun, Stephen A.; O'Neill, Michael J.; Curry, Roger W.; Titze, James R.; Niosi, Donald E.; Fujikawa, Tetsuzo; Hirata, Makizo; and Nishimura, Michio, 4,962,631, Cl. 56-17.200.
Tobery, Edward W., to Westinghouse Electric Corp. Apparatus and method for cooling a gas turbine vane. 4,962,640, Cl. 60-39.020.
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Teraoka, Masao, 4,962,837, Cl. 192-58.00C.
Todaka, Yoshihiro; Imaide, Takuya; Kinugasa, Toshiro; and Noda, Masaru, to Hitachi, Ltd. Image sensor device capable of electronic zooming. 4,963,981, Cl. 358-213.130.
Todaro, George J.: *See—*
Shoyab, Mohammed; Marquardt, Hans; and Todaro, George J., 4,963,485, Cl. 435-7.000.
Todd, Alec: *See—*
Baker, Stephen R.; Jamieson, William B., deceased; and Todd, Alec, 4,963,578, Cl. 514-381.000.
Todd, Raymond A., Jr.: *See—*
Bailey, Thomas F.; and Todd, Raymond A., Jr., 4,962,819, Cl. 175-218.000.
Todo, Eishiro: *See—*
Oku, Teruo; Todo, Eishiro; Kasahara, Chiyoshi; Nakamura, Katsuya; Kayakiri, Hiroshi; and Hashimoto, Masashi, 4,963,536, Cl. 514-76.000.
Toelken, Hans-Georg: *See—*
Beaujean, Hans-Josef; Eisenblaetter, Horst; Fues, Johann F.; Giesen, Brigitte; Holz, Erich; Jahnke, Ulrich; Kuenzel, Werner; Meffert, Alfred; Schwadtke, Karl; Smulders, Eduard; Sung, Eric; Syldatk, Andreas; Toelken, Hans-Georg; and Wegener, Ingo, 4,963,158, Cl. 8-137.000.
Togane, Hikohiro, to Mitsubishi Denki Kabushiki Kaisha. Low loss oxide magnetic material. 4,963,281, Cl. 252-62.600.
Tokai Kogyo Kabushiki Kaisha: *See—*
Amano, Katsuyuki, 4,963,413, Cl. 428-192.000.
Tokarev, Ian I.: *See—*
Kutra, Sauljus I.; Tokarev, Ian I.; Chinikas, Cheslovas V.; Dokshus, Kazimeras-Motejus K.; and Shileika, Antanas-Sigitas V., 4,962,597, Cl. 37-117.500.
Tokita, Kiyoshi; Murai, Takashi; and Fujiwara, Takeshi, to Kabushiki Kaisha Toshiba. Method and apparatus for supporting a shadow mask. 4,963,786, Cl. 313-406.000.
Tokumoto, Masao: *See—*
Ueda, Masahide; and Tokumoto, Masao, 4,963,929, Cl. 355-215.000.
Tokunaga, Shinji: *See—*
Suzuki, Hitoshi; Shiotani, Shinobu; Tokunaga, Shinji; Hirai, Tokuyuki; Fukumochi, Yoji; Kugimiya, Shuzo; and Sata, Ichiko, 4,964,030, Cl. 364-419.000.
Tokuse, Masahiro: *See—*
Yamamoto, Tadashi; Suzuki, Michiyuki; Waku, Yoshiharu; and Tokuse, Masahiro, 4,963,439, Cl. 428-614.000.
Tokyo Electric Company, Ltd.: *See—*
Kohno, Mitsunori; Umebara, Takao; Kurimoto, Yukuo; Fujii, Nobuhiko; and Akita, Hiromasa, 4,963,721, Cl. 235-462.000.
Murakami, Kazunori; Matsumoto, Yasuo; Ikumi, Tomonori; and Sato, Shoichi, 4,962,981, Cl. 350-6.700.
Tokyo Electron Limited: *See—*
Horiuchi, Takao; Arai, Izumi; and Tahara, Yoshifumi, 4,963,713, Cl. 219-121.430.
Tolunay, H. Eser: *See—*
Bell, Leslie D.; Mayer, Ernest J.; Palmier, Mark O.; Tolunay, H. Eser; Warren, Thomas G.; and Wun, Tze-Chein, 4,963,357, Cl. 424-94.640.
Tomioka, Katsumi: *See—*
Otsuki, Noboru; Oonishi, Toshihiko; Tomioka, Katsumi; and Miura, Kozo, 4,962,881, Cl. 251-149.700.
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Uchida, Kazumi; and Tomioka, Kotaro, 4,964,144, Cl. 377-15.000.
Tomizawa, Akira: *See—*
Ushio, Jiro; Miyazawa, Osamu; Tomizawa, Akira; Yokono, Hitoshi; Kanda, Naoya; Matsuura, Naoko; Ando, Setsuo; and Okudaira, Hiroaki, 4,963,974, Cl. 357-80.000.
Tomlin, James S.: *See—*
Rudy, Norman A.; and Tomlin, James S., 4,962,568, Cl. 17-52.000.
Tomozawa, Kikuo: *See—*
Yakuwa, Masahiko; Tomozawa, Kikuo; and Kishi, Kazuya, 4,964,050, Cl. 364-431.040.
Topoleski, L. D. Timmie: *See—*
Ducheyne, Paul; Topoleski, L. D. Timmie; and Cuckler, John M., 4,963,151, Cl. 623-16.000.
Toppan Printing Co., Ltd.: *See—*
Adachi, Takuya; Ito, Sukenori; Shiosaka, Akihiro; Yuzawa, Atsushi; Takada, Masaaki; Okano, Kiichiro; Kurihara, Masaru; and Uchiyama, Hiromitsu, 4,963,335, Cl. 422-302.000.
Toray Industries, Inc.: *See—*
Taniguchi, Takashi; Kurasaki, Shoichi; and Oka, Koichiro, 4,963,417, Cl. 428-327.000.
Torgerson, Peter M.: *See—*
Bolich, Raymond E., Jr.; and Torgerson, Peter M., 4,963,348, Cl. 424-71.000.
Torisawa, Akira; Itou, Noriaki; Kakizaki, Masaaki; Kato, Hiroshi; and Okamura, Shigeru, to Canon Kabushiki Kaisha. Motor control apparatus. 4,963,808, Cl. 318-685.000.
Torre, John J.; and Drummy, Michael, to Identitech. Coplanar single-coil dual function transmit and receive antenna for proximate surveillance system. 4,963,880, Cl. 343-866.000.
Tortorici, Frank J.; Barton, Kenneth R.; and Queen, Lawrence D., to Eastman Kodak Company. Inks containing glycerophospholipids and polyesters. 4,963,652, Cl. 524-604.000.
Toshiba Ceramics Co., Ltd.: *See—*
Ito, Kazuo; Matsuo, Shuitsu; and Sasaki, Yasumi, 4,963,396, Cl. 427-294.000.
Toshiba Lighting & Technology Corporation: *See—*
Takagi, Masami; and Aoyagi, Masahiko, 4,963,785, Cl. 313-318.000.
Toshiba Tungaloy Co., Ltd.: *See—*
Saitoh, Takeshi; Saito, Tuyoshi; Ueki, Mitsuo; Suzuki, Hisashi; and Kobori, Keiichi, 4,963,321, Cl. 419-13.000.
Toto, Ltd.: *See—*
Ikenaga, Takao; Shigematsu, Toshifumi; Yada, Masatoshi; Makita, Shigeru; and Kitaura, Hitoshi, 4,962,550, Cl. 4-420.000.
Touma, Hiroshi: *See—*
Nishimura, Joji; Mototani, Yuji; Asaoka, Junichi; Yanagawa, Noriyuki; and Touma, Hiroshi, 4,963,447, Cl. 429-206.000.
Towers, Christine M.: *See—*
Bryan, Philip S.; Lambert, Patrick M.; Towers, Christine M.; and Jarrold, Gregory S., 4,963,753, Cl. 250-483.100.
Bryan, Philip S.; Lambert, Patrick M.; Towers, Christine M.; and Jarrold, Gregory S., 4,963,754, Cl. 250-483.100.
Toy, Lester T.: *See—*
Chang, Rong J.; Midgley, John A.; and Toy, Lester T., 4,963,698, Cl. 174-77.00R.
Toyama, Masao: *See—*
Shimogori, Kazutoshi; Satoh, Hiroshi; Toyama, Masao; Nishimoto, Hidetoshi; Ikeda, Koki; and Kawafuku, Junji, 4,963,440, Cl. 428-651.000.
Toyama, Toshimitsu: *See—*
Sato, Kazuo; Yanai, Toshiaki; Kinoto, Takao; Tanaka, Keiji; Nishida, Akira; Toyama, Toshimitsu; Frei, Bruno; and O'Sullivan, Anthony, 4,963,582, Cl. 514-450.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Isaka, Tsutomu; and Yamashita, Toshihiro, 4,963,418, Cl. 428-34.900.
Mitamura, Hideyuki; Arimatsu, Yoshikazu; Tani, Katsuya; and Katsuo, Kenichi, 4,963,310, Cl. 264-205.000.
Toyo Seikan Kaisha, Ltd.: *See—*
Imazu, Katsuhiro; Kobayashi, Tomomi; Ishinabe, Masao; and Iwamoto, Hisao, 4,962,659, Cl. 72-349.000.

Toyoda Gosei Co., Ltd.: *See*—
Nagata, Atsushi; and Segawa, Haruhiko, 4,962,947, Cl. 280-777.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Suzuki, Ikuo; Yoneda, Takao; Tsujiuchi, Toshio; and Arimoto, Naoki, 4,963,805, Cl. 318-569.000.
Toyoda, Shuhei: *See*—
Matsuzawa, Soichiro; Kozuka, Yoshinari; Toyoda, Shuhei; Kawaguchi, Shogo; and Matsuura, Masami, 4,962,990, Cl. 350-96.200.
Toyoda, Yasuhiro; and Fukuda, Tsuyoshi, to Canon Kabushiki Kaisha. Shutter for camara. 4,963,908, Cl. 354-246.000.
Toyoda, Yasuhiro: *See*—
Nakajima, Toyohei; Mieno, Toshiyuki; Toyoda, Yasuhiro; and Horiuchi, Haruo, 4,963,246, Cl. 204-406.000.
Toyoda, Yasushi; and Mishiba, Saburo, to Sumitomo Naugatuck Co., Ltd. Adhesive composition. 4,963,613, Cl. 524-594.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Ohno, Eishi; and Nakamura, Norihiko, 4,962,745, Cl. 123-533.000.
Uranishi, Kouji; and Itou, Takaaki, 4,962,744, Cl. 123-520.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Takahashi, Tokuyuki; Kubo, Seitoku; Itoh, Hiroshi; and Fukai, Masayuki, 4,963,124, Cl. 475-278.000.
Tracy, C. Edwin; and Benson, David K., to United States of America, Energy. Passivation coating for flexible substrate mirrors. 4,963,012, Cl. 350-641.000.
Transfresh Corporation: *See*—
Bell, Laurence D., 4,962,777, Cl. 134-63.000.
Traube, Roy F.; and Danks, Michael J., to British Telecommunications public limited company. Protector device. 4,964,160, Cl. 379-412.000.
Tretten, Inc.: *See*—
Hagglund, Erik, 4,962,874, Cl. 224-277.000.
Treusch, Werner: *See*—
Gernhart, Peter; Hintz, Gerhart; Keller, Guenter; Treusch, Werner; and Zoeller, Karl, 4,962,669, Cl. 73-800.000.
Trim-A-Lawn Corporation: *See*—
Jones, Dallas W., 4,962,630, Cl. 56-12.700.
Jones, Dallas W.; Young, Lauren J.; and Nadeau, Richard P., 4,962,635, Cl. 56-12.700.
Triodyne Inc.: *See*—
Barnett, Ralph L.; Schmid, Steven R.; and Kaplan, Robert, 4,962,942, Cl. 280-5.280.
TRJ & Company: *See*—
Spaulding, Carl P., 4,963,733, Cl. 250-231.160.
Trotel, Jacques, to General Electric CGR SA. Isocentric radiology stand. 4,964,151, Cl. 378-198.000.
Trotta, Robert A., to Gillette Company, The. Dispensing brush. 4,963,047, Cl. 401-183.000.
Troughton, Nicholas A.: *See*—
Lapham, David J.; and Troughton, Nicholas A., 4,963,283, Cl. 252-79.300.
Lapham, David J.; and Troughton, Nicholas A., 4,963,342, Cl. 423-513.000.
Trout, Torence J.; Chan, Dominic M.; and Monroe, Bruce M., to Du Pont de Nemours, E. I., and Company. Holographic photopolymer compositions and elements for refractive index imaging. 4,963,471, Cl. 430-282.000.
Trowbridge, Allen R., Jr. Cover for a telephone handset. 4,964,161, Cl. 379-452.000.
Truzschler GmbH & Co. KG: *See*—
Hosel, Fritz, 4,962,569, Cl. 19-106.00R.
TRW Inc.: *See*—
McAdam, Peter L.; Schnerk, Thomas G.; and Shreve, Gregory A., 4,964,162, Cl. 380-14.000.
McCarthy, Michael C., 4,964,090, Cl. 367-162.000.
TRW Vehicle Safety Systems Inc.: *See*—
Prentkowski, David, 4,962,572, Cl. 24-323.000.
Tsay, Huang-Hsien. Light emitting writing apparatus. 4,964,024, Cl. 362-118.000.
Tseng, Shin S.; Brabander, Herbert J.; Baker, Jannie S.; and Epstein, Joseph W., to American Cyanamid Company. 1-substitute-1,2-dihydro-4-[(substituted)phenyl]imidazo-[1,5-a]pyrimidine-8-carbonitriles. 4,963,552, Cl. 514-253.000.
Tseng, Shin S.; Brabander, Herbert J.; and Epstein, Joseph W., to American Cyanamid Co. 4-[(substituted) alkylcarbonyl]-4,5-dihydro- and -4,5,6,7-tetrahydro-7-[(substituted)phenyl]pyrazolo[1,5-a]pyrimidines. 4,963,553, Cl. 514-258.000.
Tsuchimoto, Shuhei: *See*—
Katayama, Satoshi; Shimoda, Yoshihide; Sugimura, Hiroshi; Imada, Eiji; and Tsuchimoto, Shuhei, 4,963,451, Cl. 430-72.000.
Tsuchino, Hisanori: *See*—
Kano, Akiko; Tsuchino, Hisanori; Nakano, Kuniaki; Shimada, Fumio; and Honda, Satoshi, 4,963,751, Cl. 250-484.100.
Tsuda, Toru, to Bridgestone Corporation. Pneumatic tires having unidirectional tread pattern. 4,962,801, Cl. 152-209.00R.
Tsui, James B. Y.; and McCormick, William S., to United States of America, Air Force. Instantaneous frequency measurement (IFM) receiver with only two delay lines. 4,963,816, Cl. 324-77.00H.
Tsuji, Kenji: *See*—
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Tsuji, Kenji; Omaki, Takanobu; and Makai, Masaaki, 4,963,914, Cl. 354-413.000.
Tsuji, Sadafusa: *See*—
Tanaka, Yoshihiro; Tsuji, Sadafusa; Hata, Yoshiaki; Inoue, Manabu; Ootsuka, Hiroshi; Iwata, Michihiro; Ishito, Fumiaki; and Hayama, Koh, 4,963,916, Cl. 354-435.000.
Tsuji, Sadahiko, to Canon Kabushiki Kaishi. Zoom lens having built-in diaphragm. 4,963,005, Cl. 350-426.000.
Tsujii, Eisaku: *See*—
Okamoto, Masanori; Tsujii, Eisaku; Kaizu, Tsutomu; Hatanaka, Hiroshi; Okuhara, Masakuni; Sawada, Kozo; and Tanaka, Hirokazu, 4,963,585, Cl. 514-529.000.
Tsujiuchi, Toshio: *See*—
Suzuki, Ikuo; Yoneda, Takao; Tsujiuchi, Toshio; and Arimoto, Naoki, 4,963,805, Cl. 318-569.000.
Tsukahara, Kengo: *See*—
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Tsukamoto, Masaru: *See*—
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Tsukao, Ryusaku: *See*—
Takada, Mitsuyuki; Tsukao, Ryusaku; and Takasago, Hayato, 4,963,389, Cl. 427-98.000.
Tsumiyama, Yoshinori, to Kawasaki Jukogyo Kabushiki Kaisha. Maneuvering gear for small boat. 4,962,717, Cl. 114-144.00R.
Tsuno, Shingo: *See*—
Ito, Masahiro; and Tsuno, Shingo, 4,963,614, Cl. 524-495.000.
Tsushima, Susumu: *See*—
Numata, Mitsuo; Minamida, Isao; and Tsushima, Susumu, 4,963,542, Cl. 514-206.000.
Tsutaki, Shoji: *See*—
Matsuda, Kyoya; Fujioka, Yoshiharu; and Tsutaki, Shoji, 4,962,584, Cl. 29-603.000.
Tsutsumi, Hideo: *See*—
Murata, Masayoshi; Tsutsumi, Hideo; Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, 4,963,543, Cl. 514-210.000.
Murata, Masayoshi; Tsutsumi, Hideo; Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, 4,963,544, Cl. 514-210.000.
Tsutsumitake, Hideyuki; Muranaga, Tetsuro; and Moriyasu, Takashi, to Kabushiki Kaisha Toshiba. Method and apparatus for constraint-oriented inference. 4,964,064, Cl. 364-513.000.
Tsuzuki, Yukio: *See*—
Fujii, Tetsuo; Kuroyanagi, Susumu; and Tsuzuki, Yukio, 4,963,505, Cl. 437-62.000.
Tu, Chin-Yun J.; Clark, George W.; and Borsotti, Giampietro, to Erbamont, Inc. Process for preparing bis (3,5-dioxopiperazinyl) alkanes or alkenes. 4,963,679, Cl. 544-357.000.
Tucker, James C.: *See*—
Schultz, Roger L.; and Tucker, James C., 4,962,815, Cl. 166-387.000.
Tulk, Steven E.: *See*—
Belliveau, Richard S.; Floyd, Michael R.; and Tulk, Steven E., 4,962,687, Cl. 84-464.00R.
Tully-Wilkins, Charles Henry, Jr.: *See*—
Wilkins, Charles H. T.; Hammack, Jack; and Thompson, Charles B., 4,963,280, Cl. 252-58.000.
Tully-Wilkins Frazier, Linda Ann: *See*—
Wilkins, Charles H. T.; Hammack, Jack; and Thompson, Charles B. (Thelma Crawford Wilkins, executrix assors. to), 4,963,280, Cl. 252-58.000.
Tung, Pham N., to Thomson Hybrides et Microondes. Digital/analog converter with high output voltage stability. 4,963,873, Cl. 341-153.000.
Tupper, David E.: *See*—
Hotten, Terrence M.; Timms, Graham H.; and Tupper, David E., 4,963,558, Cl. 514-293.000.
Turbotak Inc.: *See*—
Burgess, J. Stuart; Spink, Donald R.; and Stein, Jerry Y., 4,963,329, Cl. 422-168.000.
Turgeon, Milton R.: *See*—
Ferraro, John R.; Foerster, Philip P.; Greenstreet, Peter T.; Schwarz, Steven R.; and Turgeon, Milton R., 4,962,798, Cl. 244-137.100.
Turkia, Erkki; and Hautala, Jouko, to Oy Tampella Ab. Decker with partitions for filtrate fractions. 4,963,270, Cl. 210-770.000.
Turner, Terry L.: *See*—
Lentino, Lynn E.; and Turner, Terry L., 4,963,779, Cl. 310-71.000.
Turnipseed, John M.: *See*—
Chapin, J. Thomas; Hardee, Addison G., Jr.; Larseon-Moss, Lisa M.; Leshe, Charles M.; Overton, Bob J.; Shea, John W.; Taylor, Carl R.; and Turnipseed, John M., 4,962,992, Cl. 350-96.230.
Tuttle, Wayne H., to Venable Industries, Inc. Variable polarity power supply for welding. 4,963,715, Cl. 219-130.400.
Tutumi, Yasutugu: *See*—
Sakai, Kunito; Tanaka, Sueyosi; Tutumi, Yasutugu; and Morita, Yutaka, 4,963,307, Cl. 264-102.000.
Tyrrell, Raymond E.; and Afify, Manal E., to Alcatel NA, Inc. Data communication bypass apparatus and method. 4,964,095, Cl. 370-55.000.
Tzeng, Jyh-Cherng J., to Intel Corporation. Three-dimensional memory cell with integral select transistor. 4,964,080, Cl. 365-185.000.
Tzikas, Athanassios, to Ciba-Geigy Corporation. Fiber-reactive dyes containing two chromophoric system bound to a bridging member consisting of two or three triazinyl radicals. 4,963,659, Cl. 534-618.000.
Ube Industries, Ltd.: *See*—
Inoue, Hiroshi; Muramatsu, Tadao; and Hirano, Tetsuji, 4,963,645, Cl. 528-342.000.
Yamamoto, Tadashi; Suzuki, Michiyuki; Waku, Yoshiharu; and Tokuse, Masahiro, 4,963,439, Cl. 428-614.000.
Ubhayakar, Shivadev K.; and Baker, Robert D. Robotic arm systems. 4,964,062, Cl. 364-513.000.

UCB Societe Anonyme: *See*—
Koshiba, Mitsunobu; Yamada, Keiichi; Harita, Yoshiyuki; Roland, Bruno; and Vandendriesshe, Jan, 4,963,463, Cl. 430-191.000.
Uchida, Kazumi; and Tomioka, Kotaro, to Fuji Electric Co., Ltd. Counter for electric switch device. 4,964,144, Cl. 377-15.000.
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Esch, John W., 4,964,063, Cl. 364-513.000.
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Dorman, William J., 4,963,963, Cl. 358-113.000.
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Huxtable, William P.; Griffith, William L.; and Compere, Alicia L., 4,963,341, Cl. 423-499.000.
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Kunerth, Dennis C.; and Lassahn, Gordon D., 4,962,656, Cl. 72-56.000.
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Thacker, Louis H., 4,963,747, Cl. 250-388.000.
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Thommen, Werner F., 4,963,840, Cl. 331-111.000.
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Uranishi, Kouji; and Itou, Takaaki, to Toyota Jidosha Kabushiki Kaisha. Device for detecting malfunction of fuel evaporative purge system. 4,962,744, Cl. 123-520.000.
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Urushibata, Kenichi; Kojima, Keiichi; Sugawara, Kiyoto; and Saen, Haruo, to Sumitomo Electric Industries, Ltd. Apparatus for connecting sets of electric wires to lead wires. 4,963,699, Cl. 174-88.00R.
Ushio, Jiro; Miyazawa, Osamu; Tomizawa, Akira; Yokono, Hitoshi; Kanda, Naoya; Matsuura, Naoko; Ando, Setsuo; and Okudaira, Hiroaki, to Hitachi, Ltd. Electronic device plated with gold by means of an electroless gold plating solution. 4,963,974, Cl. 357-80.000.
Utsunomiya, Masaaki; and Izawa, Fumio, to Kabushiki Kaisha Toshiba. Tape position detection apparatus having start control and initial tape position recovery. 4,963,999, Cl. 360-72.300.
Uzuka, Yoshiro; and Saito, Yoshiko, to Nippon Kayaku Kabushiki Kaisha. Use of ubenimex for treating myelodysplastic syndrome. 4,963,588, Cl. 514-563.000.
Uzuki, Kazuo, to Canon Kabushiki Kaisha. Information recording/reproducing apparatus having swingate levers for opening and closing shutter of cartridge in response to insertion and ejection of cartridge. 4,964,005, Cl. 360-99.060.
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Vajtner, Zlatko; Lopotar, Nevenka; and Djokic, Slobodan, to Sour Pliva. Metal complexes of N-methyl-11-aza-10-deoxo-10-dihydro-erythromycin A or 11-aza-10-deoxo-10-dihydro-erythromycin A, method for the manufacture thereof and their use in the manufacture of pharmaceuticals. 4,963,528, Cl. 514-29.000.
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Van Den Elst, Fredrik M. N.; and Velten, Hendrikus, to Texas Instruments Incorporated. Vehicular air heater using PTC heater tablets associated with funnel heat exchanges. 4,963,716, Cl. 219-202.000.
Van Der AA, Antonius G.; and Van Genechten, Theodorus J. M., to U.S. Philips Corporation. Diagnostic x-ray examination apparatus. 4,964,150, Cl. 378-197.000.
van Deventer, Ivor G.; and di Somma, Gerrit R. C., to G.I. Marketing CC. Valve assembly. 4,962,548, Cl. 4-211.000.
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Vannoy, Ray; and Miller, Robert W., to Manatt, Scott. Easy hitching mechanism. 4,962,945, Cl. 280-508.000.
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Verlijsdonk, Johannus G.; and Smets, Bruno M. J., to U.S. Philips Corporation. Luminescent alkaline earth metal orthosilicate, luminescent screen provided with such a silicate and low-pressure mercury vapor discharge lamp provided with such a screen. 4,963,787, Cl. 313-486.000.
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Vora, Rohitkumar H.; and Devolve, Jeffrey S., to Hoechst Celanese Corp. Polyamide-imide polymers having 12-F flourine-containing linking groups. 4,963,647, Cl. 528-350.000.
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Zumbe, Albert, to Jacobs Suchard AG. Consumer friendly chocolate. 4,963,372, Cl. 426-72.000.
Zurla, Frank A.: *See*—
Jeremiah, Thomas L.; Ruane, Albert J.; and Zurla, Frank A., 4,964,041, Cl. 364-200.000.
Zygo Corporation: *See*—
Sommargren, Gary E., 4,963,022, Cl. 356-247.000.
Zyokou, Keizou; Ito, Shinzo; and Sugiyama, Tsuyoshi, to Nippondenso Co., Ltd. Resistance welding control system. 4,963,707, Cl. 219-110.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF OCTOBER, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AXIA Incorporated: *See*—
Robinson, Robert J.; and Johnson, David B., Re. 33,382, Cl. 112-256.000.

Beck, Paul. Adjustable endless belt. Re. 33,389, Cl. 474-253.000.

Binnig, Gerd K., to International Business Machines Corporation. Atomic force microscope and method for imaging surfaces with atomic resolution. Re. 33,387, Cl. 250-306.000.

Brauer, Melvin; Downey, William J.; and Naughton, Frank C., to CasChem, Inc. Process for using ricinoleate plasticized polyurethanes for sealing electrical devices. Re. 33,392, Cl. 428-375.000.

Breton, Eric; Le Bihan, Denis; and Le Roux, Patrick, to Thomson-CGR. Process for imaging by nuclear magnetic resonance. Re. 33,391, Cl. 324-309.000.

Buckhorn, Inc.: *See*—
Miller, Daniel R.; and Deaton, Thomas P., Re. 33,384, Cl. 206-508.000.

CasChem, Inc.: *See*—
Brauer, Melvin; Downey, William J.; and Naughton, Frank C., Re. 33,392, Cl. 428-375.000.

Commissariat a l'Energie Atomique: *See*—
Lazzari, Jean-Pierre, Re. 33,383, Cl. 156-643.000.

Deaton, Thomas P.: *See*—
Miller, Daniel R.; and Deaton, Thomas P., Re. 33,384, Cl. 206-508.000.

Douglas, Donald J. Method and apparatus for sampling a plasma into a vacuum chamber. Re. 33,386, Cl. 250-288.000.

Downey, William J.: *See*—
Brauer, Melvin; Downey, William J.; and Naughton, Frank C., Re. 33,392, Cl. 428-375.000.

Industrie Aeronautiche e Rinaldo Piaggio S.p.A.: *See*—
Mazzoni, Alessandro, Re. 33,385, Cl. 244-89.000.

International Business Machines Corporation: *See*—
Binnig, Gerd K., Re. 33,387, Cl. 250-306.000.

Johnson, David B.: *See*—
Robinson, Robert J.; and Johnson, David B., Re. 33,382, Cl. 112-256.000.

Kidd, Dennis R., to Phillips Petroleum Company. Selective removal of hydrogen sulfide over zinc titanate and alumina. Re. 33,393, Cl. 423-230.000.

Knabel, Walter: *See*—
Sedlmair, Gerhard; and Knabel, Walter, Re. 33,388, Cl. 280-625.000.

Lazzari, Jean-Pierre, to Commissariat a l'Energie Atomique. Process for producing a magnetic read write head and head obtained by this process. Re. 33,383, Cl. 156-643.000.

Le Bihan, Denis: *See*—
Breton, Eric; Le Bihan, Denis; and Le Roux, Patrick, Re. 33,391, Cl. 324-309.000.

Le Roux, Patrick: *See*—
Breton, Eric; Le Bihan, Denis; and Le Roux, Patrick, Re. 33,391, Cl. 324-309.000.

Marker Deutschland GmbH: *See*—
Sedlmair, Gerhard; and Knabel, Walter, Re. 33,388, Cl. 280-625.000.

Mazzoni, Alessandro, to Industrie Aeronautiche e Rinaldo Piaggio S.p.A. Aircraft. Re. 33,385, Cl. 244-89.000.

Miller, Daniel R.; and Deaton, Thomas P., to Buckhorn, Inc. Nesting box with reduced lid flares. Re. 33,384, Cl. 206-508.000.

Naughton, Frank C.: *See*—
Brauer, Melvin; Downey, William J.; and Naughton, Frank C., Re. 33,392, Cl. 428-375.000.

Phillips Petroleum Company: *See*—
Kidd, Dennis R., Re. 33,393, Cl. 423-230.000.

Robinson, Robert J.; and Johnson, David B., to AXIA Incorporated. Self-oiling portable bag-closing sewing machine with pump. Re. 33,382, Cl. 112-256.000.

Sashida, Toshiiku. Motor device utilizing ultrasonic oscillation. Re. 33,390, Cl. 310-328.000.

Sedlmair, Gerhard; and Knabel, Walter, to Marker Deutschland GmbH. Toe piece for a safety ski-binding. Re. 33,388, Cl. 280-625.000.

Thomson-CGR: *See*—
Breton, Eric; Le Bihan, Denis; and Le Roux, Patrick, Re. 33,391, Cl. 324-309.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Barnes, Derek, to MacMillan Bloedel Limited. Long wafer waferboard. B1 4,610,913, 10-16-90, Cl. 428-215.000.

Fukuda, Misao: *See*—
Kamiyama, Yoshihiko; Fukuda, Misao; and Nagata, Akihiro, B1 4,793,057, Cl. 29-822.000.

Kamiyama, Yoshihiko; Fukuda, Misao; and Nagata, Akihiro, to Mitsuboshi Belting Ltd. Apparatus for mounting power transmission belts on and removing same from pulleys. B1 4,793,057, 10-16-90, Cl. 29-822.000.

MacMillan Bloedel Limited: *See*—
Barnes, Derek, B1 4,610,913, Cl. 428-215.000.

Matsouka, Earl: *See*—
Rosenthal, Ben J.; and Matsouka, Earl, B1 3,760,669, Cl. 83-063.000.

Minnesota Mining & Manufacturing Co., The: *See*—
Welygan, Dennis G.; and Zemke, Ronald O., B1 4,634,485, Cl. 156-244.110.

Mitsuboshi Belting Ltd.: *See*—
Kamiyama, Yoshihiko; Fukuda, Misao; and Nagata, Akihiro, B1 4,793,057, Cl. 29-822.000.

Nagata, Akihiro: *See*—
Kamiyama, Yoshihiko; Fukuda, Misao; and Nagata, Akihiro, B1 4,793,057, Cl. 29-822.000.

Rosenthal, Ben J.; and Matsouka, Earl, to Rosenthal Manufacturing Company. Sheet material feeding and cutting apparatus and control system therefor. B1 3,760,669, 10-16-90, Cl. 83-063.000.

Rosenthal Manufacturing Company: *See*—
Rosenthal, Ben J.; and Matsouka, Earl, B1 3,760,669, Cl. 83-063.000.

Savant Holdings, Inc.: *See*—
Vilardi, Frank, B1 4,226,669, Cl. 159-6.100.

Scandpower Inc.: *See*—
Waring, James P.; and Smith, Robert D., B1 4,592,230, Cl. 73-295.000.

Smith, Robert D.: *See*—
Waring, James P.; and Smith, Robert D., B1 4,592,230, Cl. 73-295.000.

Stamicarbon B.V.: *See*—
van Gasse, Rene L. E., B1 4,228,113, Cl. 264-24.000.

van Gasse, Rene L. E., to Stamicarbon B.V. Process for making objects from mineral fillers bonded with a thermosetting resin. B1 4,228,113, 10-16-90, Cl. 264-24.000.

Vilardi, Frank, to Savant Holdings, Inc. Vacuum centrifuge with magnetic drive. B1 4,226,669, 10-16-90, Cl. 159-6.100.

Waring, James P.; and Smith, Robert D., to Scandpower Inc. Apparatus for and method of determining the liquid coolant level in a nuclear reactor. B1 4,592,230, 10-16-90, Cl. 73-295.000.

Welygan, Dennis G.; and Zemke, Ronald O., to Minnesota Mining & Manufacturing Co., The. Extruded article and method of making the same. B1 4,634,485, 10-16-90, Cl. 156-244.110.

Zemke, Ronald O.: *See*—
Welygan, Dennis G.; and Zemke, Ronald O., B1 4,634,485, Cl. 156-244.110.

LIST OF DESIGN PATENTEES

Addy, Francis. Combined terrarium and potting tray. 311,357, 10-16-90, Cl. D11-145.000.

Aktiebolaget Volvo: *See*—
Falck, Frans G., 311,383, Cl. D13-177.000.

Ancona, Bruce: *See*—
Ancona, Jane; and Ancona, Bruce, 311,303, Cl. D7-641.000.

Ancona, Jane; and Ancona, Bruce, to M. Kamenstein, Inc. Cutting center. 311,303, 10-16-90, Cl. D7-641.000.

Anderson, David G.: *See*—
Datta, Bishnu P.; and Anderson, David G., 311,437, Cl. D23-233.000.

Anderson, Donald E. Golf bag cooler pack. 311,300, 10-16-90, Cl. D7-605.000.

Ando, Takaharu, to Kabushiki Kaisha Toshiba. Telephone set. 311,399, 10-16-90, Cl. D14-241.000.

Angel, Herman J. Water drive power unit. 311,372, 10-16-90, Cl. D13-114.000.

Arai, Takuya, to Fuji Photo Film Co., Ltd. Package for a disposable camera. 311,335, 10-16-90, Cl. D9-432.000.

Arato, Paul T.: *See*—
Melamenchuk, Galina; Arato, Paul T.; and Coffman, F. William, 311,305, Cl. D7-673.000.

Arkin, Howard I. Computer keypad. 311,385, 10-16-90, Cl. D14-100.000.

Armstrong, John F. Medicine clock. 311,340, 10-16-90, Cl. D10-2.000.

AT&T Bell Laboratories: *See*—
Festa, Edward W.; Johnson, Chris G.; and Yoh, Chaonong, 311,389, Cl. D14-107.000.

Attwood Corporation: *See*—
Whitley, Warwick M., II, 311,369, Cl. D12-176.000.

Banerjee, Paul. Octagonal game board. 311,427, 10-16-90, Cl. D21-20.000.

Bayly, Peter K.: *See*—
Flynn, David P.; and Bayly, Peter K., 311,334, Cl. D9-424.000.

Behringer, John, to J.G. Furniture Systems, Inc. Seat. 311,287, 10-16-90, Cl. D6-366.000.

Bell-Fruit Manufacturing Company Limited: *See*—
Sears, John L., 311,428, Cl. D21-37.000.

Bennett, Stanley M. Downrigger ball cradle. 311,434, 10-16-90, Cl. D22-199.000.

Bikini Cap Co.: *See*—
Parker, Patrick N., 311,266, Cl. D2-244.000.

Bio-Support Industries Ltd.: *See*—
Roberts, Frank L., 311,295, Cl. D6-601.000.

Bonnet Refrigeration: *See*—
Cocagne, Pierre, 311,290, Cl. D6-470.000.

Brenneman, Allen J.; and McLean, Jeanne, to Miles Inc. Data processor. 311,387, 10-16-90, Cl. D14-100.000.

Brown, Claudia D.; Eaton, Brian M.; and Carlyle, Robert B., to Hardinge Brothers, Inc. Machine tool bed. 311,407, 10-16-90, Cl. D15-141.000.

Brown, Jeffrey C., to John Fluke Mfg. Co., Inc. Digital circuit board tester. 311,345, 10-16-90, Cl. D10-78.000.

Bulgari, Paolo, to Partecipazioni Bulgari S.p.A. Necklace. 311,354, 10-16-90, Cl. D11-13.000.

Bunn-O-Matic Corporation: *See*—
Van Camp, Raymond E., 311,297, Cl. D7-308.000.

Car Mate Manufacturing Co., Ltd.: *See*—
Nakajima, Yasuhisa, 311,347, Cl. D10-98.000.

Carlyle, Robert B.: *See*—
Brown, Claudia D.; Eaton, Brian M.; and Carlyle, Robert B., 311,407, Cl. D15-141.000.

Casio Computer Co., Ltd.: *See*—
Igo, Toshio, 311,395, Cl. D14-129.000.
Yoshitake, Isamu, 311,388, Cl. D14-100.000.

Catey, Harry; and Hesla, Erling C. Extension attachment for a telephone earpiece. 311,401, 10-16-90, Cl. D14-250.000.

Cattoni, Donald F., to Spang & Company. Combined toy sand box and lid. 311,432, 10-16-90, Cl. D21-252.000.

Cautereels, Victor J. J.; DeCoster, Pieter K. J.; and Daenen, Robert H. C. M., to Dart Industries Inc. Kitchen utensil or the like. 311,307, 10-16-90, Cl. D7-683.000.

Chang, Bao L. Push-button ratchet wrench. 311,314, 10-16-90, Cl. D8-25.000.

Cheng, Vivian W. K. Telephone set. 311,397, 10-16-90, Cl. D14-149.000.

Cheng, Wen-Chin, to Hocheng Pottery Mfg. Co., Ltd. Flush toilet or similar article. 311,435, 10-16-90, Cl. D23-301.000.

Chu, Zooey C.: *See*—
Muller-Deisig, Wolfgang; Jenkins, David C.; West, Terry D.; and Chu, Zooey C., 311,286, Cl. D6-366.000.

Claber S.p.A.: *See*—
Roman, Gianfranco, 311,308, Cl. D8-4.000.

Clivio, Franco, to Gardena Kress & Kastner GmbH. Adjustable rake head. 311,310, 10-16-90, Cl. D8-13.000.

Cocagne, Pierre, to Bonnet Refrigeration. Refrigerated display case. 311,290, 10-16-90, Cl. D6-470.000.

Coffman, F. William: *See*—
Melamenchuk, Galina; Arato, Paul T.; and Coffman, F. William, 311,305, Cl. D7-673.000.

Collins, John A., Jr. Orthodontic appliance. 311,442, 10-16-90, Cl. D24-16.000.

Colorstik Ltd.: *See*—
van der Tang, Gijsbertus, 311,328, Cl. D9-337.000.

Continental Engineering Group, Inc.: *See*—
Ugalde, Carlos V., 311,291, Cl. D6-474.000.

Covert, Darrell E.; Hammond, Philip S.; and Maxwell, Paul B., to Goodyear Tire & Rubber Company, The. Tire. 311,367, 10-16-90, Cl. D12-147.000.

Cowan, Murray L., to Textron, Inc. Expansion bracelet. 311,355, 10-16-90, Cl. D11-19.000.

Croydex Company Ltd., The: *See*—
Tooley, Jonathan, 311,282, Cl. D6-349.000.

Crystal Clear Air, Inc.: *See*—
Savage, James J.; and Walsh, James A., 311,270, Cl. D23-365.000.

Culbertson, Richard, to General Electric Company. Front panel for a two-way mobile radio. 311,403, 10-16-90, Cl. D14-258.000.

Culbertson, Richard, to General Electric Company. Front and side panels for a two-way mobile radio. 311,405, 10-16-90, Cl. D14-265.000.

Cupp, Carl J., to Pachmayr Ltd. Holster. 311,277, 10-16-90, Cl. D3-101.000.

Daenen, Robert H. C. M.: *See*—
Cautereels, Victor J. J.; DeCoster, Pieter K. J.; and Daenen, Robert H. C. M., 311,307, Cl. D7-683.000.

Dallaire, Michel, to St.-Lawrence Manufacturing Canada Inc./Manufactures St.-Laurent Canada, Inc. Sled. 311,358, 10-16-90, Cl. D12-10.000.

Dalton, Stanley: *See*—
Fultz, Clinton; and Dalton, Stanley, 311,333, Cl. D9-423.000.

Danielson, Arvin D.; Geers, Robert G.; Greenfield, Calvin; Pavek, John G.; and Traeger, Robert J., to Norand Corporation. Communication quad rack unit. 311,400, 10-16-90, Cl. D14-250.000.

Dart Industries Inc.: *See*—
Cautereels, Victor J. J.; DeCoster, Pieter K. J.; and Daenen, Robert H. C. M., 311,307, Cl. D7-683.000.

Datta, Bishnu P.; and Anderson, David G., to L-TEC. Gas pressure regulator. 311,437, 10-16-90, Cl. D23-233.000.

DeCoster, Pieter K. J.: *See*—
Cautereels, Victor J. J.; DeCoster, Pieter K. J.; and Daenen, Robert H. C. M., 311,307, Cl. D7-683.000.

De Frahan, Patrick H., to Innovative Trading & Service S.A. Medallion. 311,356, 10-16-90, Cl. D11-79.000.

DeSantis, Carl, to Sundown Vitamins, Inc. Dual-faced container label. 311,423, 10-16-90, Cl. D20-22.000.

Diba, Keyvan T.; and Shapiro, Allan M. Container for lottery tickets. 311,331, 10-16-90, Cl. D9-415.000.

Donley, Paul J.; and Webster, Michael A., to Graco Inc. Adhesive supply unit. 311,408, 10-16-90, Cl. D15-199.000.

Dougherty, Thomas J.: *See*—
Morisse, Jeffrey A.; Herde, Gregg A.; Saari, David W.; Mrotek, Edward N.; and Dougherty, Thomas J., 311,373, Cl. D13-119.000.

Duke, Robert L. Tub strainer wrench with multi-positionable handle. 311,315, 10-16-90, Cl. D8-25.000.

Eastern Company, The: *See*—
Weinerman, Lee S.; and Vargus, Joel T., 311,323, Cl. D8-331.000.
Weinerman, Lee S.; and Vargus, Joel T., 311,324, Cl. D8-344.000.

Eaton, Brian M.: *See*—
Brown, Claudia D.; Eaton, Brian M.; and Carlyle, Robert B., 311,407, Cl. D15-141.000.

Edwards, Paul M., to Industrial Coating Services, Inc. Adjustable rack for supporting articles being spray-painted. 311,293, 10-16-90, Cl. D6-571.000.

Endo, Takayoshi; and Yamamoto, Masayuki, to Yazaki Corporation. Connector housing for electrical wire. 311,381, 10-16-90, Cl. D13-149.000.

Ennis, Matthew C., Jr. Vehicle utility drawer or similar article. 311,292, 10-16-90, Cl. D6-510.000.

Falck, Frans G., to Aktiebolaget Volvo. Protective cover for marine instruments on a control console. 311,383, 10-16-90, Cl. D13-177.000.

Fantasy Flavors Inc.: *See*—
Hamamura, Akimitsu, 311,330, Cl. D9-428.000.

Fender Musical Instruments Corporation: *See*—
Smith, Daniel J.; and Todd, Charles H., III, 311,414, Cl. D17-20.000.

Festa, Edward W.; Johnson, Chris G.; and Yoh, Chaonong, to AT&T Bell Laboratories. Housing for a local area network unit. 311,389, 10-16-90, Cl. D14-107.000.

Flynn, David P.; and Bayly, Peter K., to Willow Ware Australia Pty. Limited. Container. 311,334, 10-16-90, Cl. D9-424.000.

Ford Motor Company: *See*—
Grinyer, Clive A., 311,402, Cl. D14-258.000.
Repasky, Carol M., 311,404, Cl. D14-258.000.

Forsberg, Paul J. Wall block. 311,444, 10-16-90, Cl. D25-113.000.

Frahm, Carl E.; and Rokus, B. Joseph, to Rokus, Joseph; and Rokus, Tari. Bottle. 311,329, 10-16-90, Cl. D9-400.000.

Fratelli Guzzini S.p.A.: *See*—
Pozzi, Ambrogio, 311,302, Cl. D7-629.000.

Fuji Photo Film Co., Ltd.: *See*—
Arai, Takuya, 311,335, Cl. D9-432.000.

Fujimura, Yoshinao; Ueda, Taro; and Saitoh, Yusuke, to Honda Giken Kogyo Kabushiki Kaisha. Automobile. 311,361, 10-16-90, Cl. D12-92.000.

Fultz, Clinton; and Dalton, Stanley, to Fultz, Clinton. Container. 311,333, 10-16-90, Cl. D9-423.000.
Gagnon, Bernard G. Nutcracker. 311,306, 10-16-90, Cl. D7-680.000.
Garcia, Jesse C. Combined vehicle fishing rod holder and luggage carrier. 311,368, 10-16-90, Cl. D12-157.000.
Garcia, Ricardo. Combined paint roller and applicator. 311,280, 10-16-90, Cl. D4-122.000.
Gardena Kress & Kastner GmbH: *See*—
Clivio, Franco, 311,310, Cl. D8-13.000.
Garrill, Karl A.: *See*—
Long, Norman A.; and Garrill, Karl A., 311,443, Cl. D24-62.000.
Geer, Kenton D.: *See*—
Graham, Kenneth; and Geer, Kenton D., 311,269, Cl. D2-318.000.
Geers, Robert G.: *See*—
Danielson, Arvin D.; Geers, Robert G.; Greenfield, Calvin; Pavek, John G.; and Traeger, Robert J., 311,400, Cl. D14-250.000.
General Electric Company: *See*—
Culbertson, Richard, 311,403, Cl. D14-258.000.
Culbertson, Richard, 311,405, Cl. D14-265.000.
Keck, Arthur C., 311,378, Cl. D13-146.000.
Glaxo Group Limited: *See*—
Long, Norman A.; and Garrill, Karl A., 311,443, Cl. D24-62.000.
Goffman, Joel H. Eye shield. 311,409, 10-16-90, Cl. D16-100.000.
Gold Star Co., Ltd.: *See*—
Shim, Jae J., 311,394, Cl. D14-129.000.
Goldberg, Herbert B., to Mohasco Upholstered Furniture Corp. Cocktail table. 311,284, 10-16-90, Cl. D6-484.000.
Goodner, Donna E.: *See*—
Weaver, Frederick M.; and Goodner, Donna E., 311,393, Cl. D14-116.000.
Goodyear Tire & Rubber Company, The: *See*—
Covert, Darrell E.; Hammond, Philip S.; and Maxwell, Paul B., 311,367, Cl. D12-147.000.
Graco Inc.: *See*—
Donley, Paul J.; and Webster, Michael A., 311,408, Cl. D15-199.000.
Graham, Kenneth; and Geer, Kenton D., to Hyde Athletic Industries, Inc. Insole. 311,269, 10-16-90, Cl. D2-318.000.
Greene, Jeffrey P., to Nu-Tec Incorporated. Stove. 311,441, 10-16-90, Cl. D23-346.000.
Greenfield, Calvin: *See*—
Danielson, Arvin D.; Geers, Robert G.; Greenfield, Calvin; Pavek, John G.; and Traeger, Robert J., 311,400, Cl. D14-250.000.
Grinyer, Clive A., to Ford Motor Company. Apertured panel for a combined vehicular tape player and radio or the like. 311,402, 10-16-90, Cl. D14-258.000.
Gross, Robert F., to Q.A. Technology Company. Electronic test probe. 311,346, 10-16-90, Cl. D10-80.000.
Groswith, Charles T., III; and San, Rickson, to Taurus Holdings, Inc. Combined paper sheets and aperture fasteners therefor. 311,418, 10-16-90, Cl. D19-26.000.
Hall, Charles P. Underwater viewer. 311,410, 10-16-90, Cl. D16-130.000.
Hallam, Keith J.; and Smith, Kenneth H., to Thrall Car Manufacturing Company. Railroad hopper car cross ridge collar casting. 311,359, 10-16-90, Cl. D12-42.000.
Hamamura, Akimitsu, to Fantasy Flavors Inc. Confection package. 311,330, 10-16-90, Cl. D9-428.000.
Hammond, Philip S.: *See*—
Covert, Darrell E.; Hammond, Philip S.; and Maxwell, Paul B., 311,367, Cl. D12-147.000.
Hand Held Products, Inc.: *See*—
Weaver, Frederick M.; and Goodner, Donna E., 311,393, Cl. D14-116.000.
Haraldsson, Rune K., to Westvaco Corporation. Tray blank. 311,336, 10-16-90, Cl. D9-433.000.
Hardinge Brothers, Inc.: *See*—
Brown, Claudia D.; Eaton, Brian M.; and Carlyle, Robert B., 311,407, Cl. D15-141.000.
Hatano, Katsuhiro: *See*—
Suzuki, Tetsuro; and Hatano, Katsuhiro, 311,353, Cl. D10-129.000.
Hatfield, Tinker L., to Nike, Inc.; and Nike International, Ltd. Shoe upper. 311,268, 10-16-90, Cl. D2-314.000.
Herde, Gregg A.: *See*—
Morisse, Jeffrey A.; Herde, Gregg A.; Saari, David W.; Mrotek, Edward N.; and Dougherty, Thomas J., 311,373, Cl. D13-119.000.
Hesla, Erling C.: *See*—
Catey, Harry; and Hesla, Erling C., 311,401, Cl. D14-250.000.
Hess, James P. Label for golf equipment. 311,424, 10-16-90, Cl. D20-22.000.
Hillary, Christopher J.; and Rodd, Timothy J., to International Business Machines Corporation. Adjustable support for a display monitor. 311,392, 10-16-90, Cl. D14-114.000.
Hocheng Pottery Mfg. Co., Ltd.: *See*—
Cheng, Wen-Chin, 311,435, Cl. D23-301.000.
Hodkinson, John P., Jr.: *See*—
Wilson, Jewell E.; Hodkinson, John P., Jr.; and Molineux, A. L., 311,289, Cl. D6-461.000.
Hoepfner, Thomas L. Combined grass catcher blower and chute. 311,406, 10-16-90, Cl. D15-17.000.
Homark Associates Limited: *See*—
Start, Michael J., 311,299, Cl. D7-397.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Fujimura, Yoshinao; Ueda, Taro; and Saitoh, Yusuke, 311,361, Cl. D12-92.000.
Yoshikawa, Humirou; Nishimura, Tsuyoshi; and Ueda, Syuhei, 311,360, Cl. D12-92.000.
Houlihan, John T., to Timex Corporation. Combined wristwatch and count-down timer. 311,342, 10-16-90, Cl. D10-30.000.
Hughes, Mack. Holder for a bucket or similar article. 311,327, 10-16-90, Cl. D8-370.000.
Huxley, Terrence; and Lewis, Garry I. Combined spirit level and angle-indicating device. 311,343, 10-16-90, Cl. D10-62.000.
Huxley, Terrence: *See*—
Lewis, Garry I.; and Huxley, Terrence, 311,341, Cl. D10-62.000.
Hyde Athletic Industries, Inc.: *See*—
Graham, Kenneth; and Geer, Kenton D., 311,269, Cl. D2-318.000.
I.W. Industries: *See*—
Strignano, Joseph, 311,438, Cl. D23-242.000.
Strignano, Joseph, 311,440, Cl. D23-241.000.
Igo, Toshio, to Casio Computer Co., Ltd. Combined video tape recorder and television set. 311,395, 10-16-90, Cl. D14-129.000.
Industrial Coating Services, Inc.: *See*—
Edwards, Paul M., 311,293, Cl. D6-571.000.
Ingold, William E.: *See*—
Lazere, Arthur B.; Ingold, William E.; and Knilans, Bradley N., 311,384, Cl. D14-100.000.
Innovative Trading & Service S.A.: *See*—
De Frahan, Patrick H., 311,356, Cl. D11-79.000.
International Business Machines Corporation: *See*—
Hillary, Christopher J.; and Rodd, Timothy J., 311,392, Cl. D14-114.000.
Ishigame, Shinichi: *See*—
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Ishihara, Kousei. Dent puller. 311,317, 10-16-90, Cl. D8-51.000.
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Jans, Franz W., to Jado Bathroom and Hardware Manufacturing Corp. Door handle. 311,321, 10-16-90, Cl. D8-308.000.
Jans, Franz W., to Jado Bathroom and Hardware Manufacturing Corp. Furniture handle. 311,322, 10-16-90, Cl. D8-316.000.
Jenkins, C. D., to 'Totes', Incorporated. Umbrella handle. 311,273, 10-16-90, Cl. D3-15.000.
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Kameyama, Isao; and Maeda, Akira, to Yazaki Corporation. Housing for an electrical connector. 311,380, 10-16-90, Cl. D13-146.000.
Kawashima, Toshiharu; Jinno, Keishi; and Sawada, Yoshitsugu, to Yazaki Corporation. Housing for an electrical connector. 311,374, 10-16-90, Cl. D13-133.000.
Keck, Arthur C., to General Electric Company. Terminal block assembly for a leadless motor. 311,378, 10-16-90, Cl. D13-146.000.
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Kuba, Lawrence, to Wang Laboratories, Inc. Video display. 311,390, 10-16-90, Cl. D14-113.000.
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Kuzuno, Katsutoshi; Ishizuka, Shigeo; Watanabe, Hiroshi; and Sakurai, Kazuaki, to Yazaki Corporation. Housing for an electrical connector. 311,379, 10-16-90, Cl. D13-146.000.
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Laury, Micha. Combined key ring and container. 311,274, 10-16-90, Cl. D3-61.000.
Lazere, Arthur B.; Ingold, William E.; and Knilans, Bradley N., to Northgate Computer Systems, Inc. Keyboard. 311,384, 10-16-90, Cl. D14-100.000.
Lee, Kil J. Rotatable garment stand. 311,288, 10-16-90, Cl. D6-415.000.
Lewis, Garry I.; and Huxley, Terrence. Combined spirit level and angle-indicated device. 311,341, 10-16-90, Cl. D10-62.000.
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Lin, C. Mini-duster or similar article. 311,279, 10-16-90, Cl. D4-135.000.
Lin, Chih-Chung. Baby carriage. 311,363, 10-16-90, Cl. D12-129.000.
Lindsay, Tom E. Display stand for encouraging children to brush their teeth. 311,425, 10-16-90, Cl. D20-21.000.
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Litowitz, Robert H. Window shade pull or similar article. 311,294, 10-16-90, Cl. D6-581.000.
Long, Norman A.; and Garrill, Karl A., to Glaxo Group Limited. Inhalator. 311,443, 10-16-90, Cl. D24-62.000.
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MacDonald, Peter S., to Wang Laboratories, Inc. Computer. 311,386, 10-16-90, Cl. D14-100.000.
MacDonald, Sumner B. Key holder. 311,275, 10-16-90, Cl. D3-61.000.
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Mann, Kevin D. Combined glove and watch. 311,271, 10-16-90, Cl. D2-614.000.
Mardock, Jerry S. Combined writing instrument grip and eraser holder. 311,421, 10-16-90, Cl. D19-55.000.
Mastro, Louis L.; and Parker, Kenneth R., to Pioneer Data Corporation. Talking smoke detector. 311,348, 10-16-90, Cl. D10-106.000.
Mastrodicasa, Arthur R. Shelf. 311,285, 10-16-90, Cl. D6-511.000.
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McClelland, Paul. Holder for a skinning knife. 311,319, 10-16-90, Cl. D8-98.000.
McCoy, Frank C. Rake. 311,309, 10-16-90, Cl. D8-13.000.
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Meeker, Paul K., to Spalding & Evenflo Companies, Inc. Child's safety seat. 311,281, 10-16-90, Cl. D6-333.000.
Melamenchuk, Galina; Arato, Paul T.; and Coffman, F. William, to Melamenchuk, Galina. Food slicer. 311,305, 10-16-90, Cl. D7-673.000.
Mendenhall, George A. French fry. 311,265, 10-16-90, Cl. D1-111.000.
Metzger, Lynn. Hook for use in concrete construction. 311,311, 10-16-90, Cl. D8-14.000.
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Mollenhoff, David V. Hot beverage maker. 311,298, 10-16-90, Cl. D7-300.000.
Moor, Marc L., to Mead Corporation, The. Folder. 311,419, 10-16-90, Cl. D19-27.000.
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Morisse, Jeffrey A.; Herde, Gregg A.; Saari, David W.; Mrotek, Edward N.; and Dougherty, Thomas J., to Johnson Service Company. Adjustable battery width and height adaptor. 311,373, 10-16-90, Cl. D13-119.000.
Morton, James F. Combined fifth wheel pin puller and tire knocker. 311,312, 10-16-90, Cl. D8-14.000.
Mrotek, Edward N.: *See*—
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Muller-Deisig, Wolfgang; Jenkins, David C.; West, Terry D.; and Chu, Zooey C., to Steelcase Inc. Chair. 311,286, 10-16-90, Cl. D6-366.000.
Nakajima, Yasuhisa, to Car Mate Manufacturing Co., Ltd. Tachometer. 311,347, 10-16-90, Cl. D10-98.000.
Nelson, Marvin I. Truck floor bed tie-down device. 311,326, 10-16-90, Cl. D8-356.000.
Niderost, Kevin J., to SP Tyres UK Limited. Vehicle tire. 311,365, 10-16-90, Cl. D12-146.000.
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Ohta, Kunio, to Nippon Gakki Seizu Kabushiki Kaisha. Combined grand piano keyboard cover and auto-play control unit. 311,412, 10-16-90, Cl. D17-9.000.
Oka, Tatsuya; Ogawa, Hideki; and Sugata, Sho-Ichi, to Sumitomo Wiring Systems, Ltd. Electrical connector assembly. 311,377, 10-16-90, Cl. D13-133.000.
Ovens, Melvin L. Head for a pole-type sander. 311,318, 10-16-90, Cl. D8-90.000.
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Pakis, Andrew. Guitar body. 311,413, 10-16-90, Cl. D17-20.000.
Paris, Patricia L., to Northern Financial Corporation. Doll. 311,430, 10-16-90, Cl. D21-174.000.
Park, Brian H. Jet aircraft with circular hollow wings. 311,370, 10-16-90, Cl. D12-331.000.
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Pesta, Richard K. Football fan's novelty hat. 311,267, 10-16-90, Cl. D2-250.000.
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Pozzi, Ambrogio, to Fratelli Guzzini S.p.A. Container for food. 311,302, 10-16-90, Cl. D7-629.000.
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Repasky, Carol M., to Ford Motor Company. Front panel for a compact disc player. 311,404, 10-16-90, Cl. D14-258.000.
Richardson, Michael M.; and Ringle, Geoff, to Kroy Inc. Thermal printer tape ribbon cartridge. 311,416, 10-16-90, Cl. D18-22.000.
Rigby, William R., to Westvaco Corporation. Twin tray blank. 311,337, 10-16-90, Cl. D9-433.000.

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Rokus, Tari: *See—*
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Roman, Gianfranco, to Claber S.p.A. Planting tool. 311,308, 10-16-90, Cl. D8-4.000.

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Santoiemmo, Carl V., to United Soda, Inc. Carbonator. 311,296, 10-16-90, Cl. D7-300.000.

Sato, Zensuke. Instrument for diagonal observation by microscope. 311,411, 10-16-90, Cl. D16-131.000.

Savage, James J.; and Walsh, James A., to Crystal Clear Air, Inc. Air filtration unit. 311,270, 10-16-90, Cl. D23-365.000.

Sawada, Yoshitsugu: *See—*
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Serio, Donald L., Jr., to Serco Mold, Inc. Seal for containers. 311,338, 10-16-90, Cl. D9-434.000.

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Shim, Jae J., to Gold Star Co., Ltd. Combined video cassette recorder and television receiver. 311,394, 10-16-90, Cl. D14-129.000.

Simpson, Johnny R. Fan or similar article. 311,272, 10-16-90, Cl. D3-1.000.

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Starnes, Gary B. Food and beverage carrying tray. 311,301, 10-16-90, Cl. D7-616.000.

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Steele, Richard L. Doll bed. 311,429, 10-16-90, Cl. D21-123.000.

Strater, Fritz. Table-mountable adjustable copy holder. 311,422, 10-16-90, Cl. D19-88.000.

Strignano, Joseph, to I.W. Industries. Faucet set. 311,438, 10-16-90, Cl. D23-242.000.

Strignano, Joseph, to I.W. Industries. Faucet. 311,440, 10-16-90, Cl. D23-241.000.

Sugano, Yoshihiko, to Kabushiki Kaisha Toshiba. Telephone. 311,398, 10-16-90, Cl. D14-151.000.

Sugata, Sho-Ichi: *See—*
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Sullivan, Michael C. Air ratchet hanging device. 311,325, 10-16-90, Cl. D8-396.000.

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Suzuki, Tetsuro; and Hatano, Katsuhiro, to Seikosha Co., Ltd. Clock movement. 311,353, 10-16-90, Cl. D10-129.000.

Swanson, Robert A. Water driven rotary brush for washing wire wheels or similar articles. 311,278, 10-16-90, Cl. D4-115.000.

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Ueshin, Akito; Kushima, Hidekiyo; and Ishigame, Shinichi, to Kabushiki Kaisha Toshiba. Data recording cartridge for language learning machine. 311,391, 10-16-90, Cl. D14-114.000.

Ugalde, Carlos V., to Continental Engineering Group, Inc. Computer workstation. 311,291, 10-16-90, Cl. D6-474.000.

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van der Tang, Gijsbertus, to Colorstik Ltd. Combined container and closure. 311,328, 10-16-90, Cl. D9-337.000.

Vanish, George M. Shellfish gauge. 311,344, 10-16-90, Cl. D10-64.000.

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Wang Laboratories, Inc.: *See—*
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MacDonald, Peter S., 311,386, Cl. D14-100.000.

Warren, Frank A., to 501 Benchcraft, Inc. Seat. 311,283, 10-16-90, Cl. D6-378.000.

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Kuzuno, Katsutoshi; Ishizuka, Shigeo; Watanabe, Hiroshi; and Sakurai, Kazuaki, 311,379, Cl. D13-146.000.

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Haraldsson, Rune K., 311,336, Cl. D9-433.000.
Rigby, William R., 311,337, Cl. D9-433.000.
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Whiteside, John F., to Sloan Valve Company. Wrench. 311,313, 10-16-90, Cl. D8-17.000.
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ISSUED OCTOBER 16, 1990

NOTE.—First number, class; second number, subclass; third number, patent number

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161 A 4,962,547

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21.1 4,962,575

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623.5 4,963,161
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148 4,962,705
212 4,962,707
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CLASS 109

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CLASS 110

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287 4,962,714
451 4,962,715

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723 4,962,727

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90.16 4,962,732
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435 4,962,739
481 4,962,740
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496 4,962,743
520 4,962,744
533 4,962,745
613 4,962,746

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66 4,962,759
80 F 4,962,760
80 H 4,962,768
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595 4,962,762
653 A 4,962,763
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CLASS 134

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63 4,962,777
169 C 4,962,778

CLASS 135

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20 R 4,962,780
65 4,962,781
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CLASS 136

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257.000 4,963,196

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625.66 4,962,791

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CLASS 148

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307 4,963,199
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CLASS 149

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35 4,963,202
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CLASS 150

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CLASS 165

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217 4,962,813
288 4,962,814
387 4,962,815

CLASS 172

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15.6 4,963,694
23 C 4,963,695
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77 R 4,963,698
88 R 4,963,699
138 F 4,963,700
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218 4,962,819
220 4,962,820
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CLASS 180

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CLASS 182

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CLASS 184

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CLASS 192

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58 C 4,962,837
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643 4,962,847
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61.55 4,963,704
86 R 4,963,705
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CLASS 204

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121.63 4,963,714
130.4 4,963,715
202 4,963,716
270 4,963,717

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69 4,962,863
270 4,962,864
444 4,962,865
613 4,962,862

CLASS 221

8 4,962,866
130 4,962,867

CLASS 222

49 4,962,868
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207 4,962,870
209 4,962,851
504 4,962,871
516 4,962,872

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12 4,963,298
22 4,963,299
4,963,300
24 B1 4,228,113
29.7 4,963,301
40.4 4,963,302
41 4,963,303
49 4,963,304
60 4,963,305
101 4,963,306
102 4,963,307
159 4,963,308
175 4,963,309
205 4,963,310
210.8 4,963,311
327 4,963,312
573 4,963,313

CLASS 267

140.1 4,962,915
153 4,962,916

CLASS 269

56 4,962,917
156 4,962,918

CLASS 271

3.1 4,962,919
293 4,962,920

CLASS 272

1 B 4,962,921
15 4,962,922
71 4,962,923
73 4,962,925

CLASS 273

26 R 4,962,924
29 R 4,962,929
58 K 4,962,926
73 D 4,962,928
146 4,962,930
162 E 4,962,927
164 4,962,931
171 4,962,932
183 R 4,963,314
186 C 4,962,933
249 4,962,934
411 4,962,935

CLASS 277

37 4,962,936
68 4,962,937
201 4,962,938
235 B 4,962,939

CLASS 280

5.22 4,962,940
4,962,941
5.28 4,962,942
508 4,962,945
625 Re.33,388
691 4,963,759
707 4,962,943
710 4,962,946
775 4,962,944
777 4,962,947
804 4,962,948

CLASS 281

35 4,962,949

CLASS 283

67 4,962,950
114 4,962,951

CLASS 285

24 4,962,952
55 4,962,958

CLASS 290

48 4,963,760
55 4,963,761

CLASS 292

36 4,962,953
175 4,962,954
216 4,962,955

CLASS 294

1.4 4,962,956
19.1 4,962,957

CLASS 296

95.1 4,962,959
120.1 4,962,960
192 4,962,961

CLASS 297

183 4,963,762
300 4,962,962
361 4,962,963
457 4,962,964
467 4,962,965

CLASS 298

23 R 4,962,966

CLASS 299

41 4,962,967

CLASS 301

108 SC 4,962,968

CLASS 303

3 4,962,969
100 4,962,970
4,962,971
116 4,962,972
4,962,975

CLASS 307

35 4,963,763
270 4,963,764
443 4,963,765
451 4,963,766
455 4,963,767
465 4,963,768
4,963,769
4,963,770
475 4,963,771
480 4,963,772
511 4,963,773
585 4,963,774

CLASS 310

49 R 4,963,775
64 4,963,776
68 A 4,963,777
68 D 4,963,778
71 4,963,779
104 4,963,780
323 4,963,781
328 Re.33,390
358 4,963,782

CLASS 312

325 4,962,973
333 4,962,974

CLASS 313

22 4,963,783
25 4,963,790
4,963,791
131 R 4,963,784
318 4,963,785
406 4,963,786
486 4,963,787
503 4,963,788

CLASS 315

8 4,963,789
58 4,963,792
74 4,963,793
81 4,963,794
205 4,963,795
246 4,963,796
309 4,963,797
312 4,963,798
345 4,963,799

CLASS 318

81 4,962,976
254 4,963,800
4,963,801
294 4,963,802
460 4,963,804
569 4,963,803
4,963,805
621 4,963,806
632 4,963,807
685 4,963,808
696 4,963,809
778 4,963,810

CLASS 320

1 4,963,811
2 4,963,812
17 4,963,813

CLASS 323

274 4,963,814

CLASS 324

77 H 4,963,816
83 D 4,963,817
117 R 4,963,818
126 4,963,819
142 4,963,820
158 P 4,963,821
4,963,822
158 R 4,963,823
4,963,824
4,963,825
202 4,963,826
251 4,963,827
309 Re.33,391
404 4,963,828
660 4,963,829
715 4,963,815
4,963,830

CLASS 329

318 4,963,831

CLASS 330

4.3 4,963,832
65 4,963,833
253 4,963,834
4,963,835
254 4,963,836
264 4,963,837

CLASS 331

2 4,963,838
17 4,963,839
111 4,963,840

CLASS 333

13 4,963,842
202 4,963,841
203 4,963,843
208 4,963,844
214 4,963,845

CLASS 335

42 4,963,846
59 4,963,847
172 4,963,848
201 4,963,849

CLASS 337

244 4,962,977
246 4,963,850
395 4,963,851

CLASS 338

32 S 4,963,852

CLASS 340

310 A 4,963,853
384 E 4,963,854
391 4,963,855
426 4,963,856
606 4,963,857
710 4,963,858
712 4,963,859
719 4,963,860
781 4,963,861
825.52 4,963,862
825.880 4,963,863
995 4,963,864
4,963,865

CLASS 341

60 4,963,867
72 4,963,868
83 4,963,869
110 4,963,866
118 4,963,870
131 4,963,881
133 4,963,871
142 4,963,872
153 4,963,873
159 4,963,874
164 4,963,875
176 4,963,876

CLASS 342

25 4,963,877
44 4,963,887
90 4,963,888
357 4,963,889
359 4,963,890

CLASS 343

700 MS 4,963,891
4,963,892
781 P 4,963,878
792 4,963,879
866 4,963,880

CLASS 346

1.1 4,963,882
4,963,883
4,963,884
76 L 4,963,901
76 PH 4,963,885
4,963,886
4,963,893
107 R 4,963,894
108 4,963,895
134 4,963,896
140 R 4,963,897
157 4,963,898
4,963,899
160 4,963,900

CLASS 350

1.1 4,962,979
6.6 4,962,980
6.7 4,962,981
6.8 4,962,982
4,962,983
4,962,984
96.15 4,962,985
4,962,986
4,962,987
96.18 4,962,988
96.20 4,962,989
4,962,990
96.21 4,962,991
96.23 4,962,992
96.29 4,962,993
96.33 4,962,994
96.34 4,962,995
4,962,996
172 4,962,997
174 4,962,998
247 4,962,999
254 4,963,000
331 R 4,963,001
336 4,963,002
403 4,963,003
4,963,004
426 4,963,005
427 4,963,006
432 4,963,007
452 4,963,008
453 4,963,009
481 4,963,010
584 4,963,011
641 4,963,012

CLASS 351

114 4,963,013
205 4,963,014

CLASS 352

57 4,963,015

CLASS 353

74 4,963,016

CLASS 354

64 4,963,902
81 4,963,903
82 4,963,904
152 4,963,905
219 4,963,906
222 4,963,907
246 4,963,908
286 4,963,909

400 4,963,910
403 4,963,911
404 4,963,912
406 4,963,913
413 4,963,914
432 4,963,915
435 4,963,916
484 4,963,917

CLASS 355

19 4,963,918
40 4,963,919
4,963,920
53 4,963,921
68 4,963,923
77 4,963,924
4,963,925
203 4,963,926
207 4,963,927
208 4,963,922
210 4,963,928
215 4,963,929
4,963,930
218 4,963,931
4,963,932
4,963,933
235 4,963,934
245 4,963,935
4,963,936
251 4,963,937
260 4,963,938
4,963,939
4,963,940
282 4,963,941
290 4,963,942
4,963,943
298 4,963,944
308 4,963,946

CLASS 356

1 4,963,017
4,963,018
28 4,963,019
73.1 4,963,020
153 4,963,021
247 4,963,022
308 4,963,023
342 4,963,024
350 4,963,026
376 4,963,025
401 4,963,029
416 4,963,027
445 4,963,028

CLASS 357

4 4,963,947
16 4,963,948
4,963,949
23.4 4,963,950
4,963,970
23.5 4,964,143
23.7 4,963,951
24 4,963,952
4,963,953
26 4,963,954
30 4,963,955
30 H 4,963,956
34 4,963,957
37 4,963,971
38 4,963,972
42 4,963,973
80 4,963,974
81 4,963,975
82 4,963,976

CLASS 358

22 4,963,977
29 4,963,978
37 4,963,958
4,963,979
88 4,963,959
98 4,963,960
105 4,963,961
108 4,963,962
113 4,963,963
133 4,963,030
134 4,963,964
140 4,963,965
143 4,963,967
147 4,963,968
174 4,963,969
209 4,963,980
213.13 4,963,981
213.18 4,963,982
213.31 4,963,983
225 4,963,984
227 4,963,985
228 4,963,986
229 4,963,987
296 4,963,988
298 4,963,989
4,963,990
310 4,963,991
330 4,963,993
335 4,963,992
4,963,994
4,963,995
349 4,963,966
453 4,963,996
493 4,963,997

CLASS 360

14.1 4,964,004
60 4,963,998
72.3 4,963,999
77.14 4,964,000
94 4,964,001
95 4,964,002
96.1 4,964,003
99.06 4,964,005
108 4,964,006
125 4,964,007
130.24 4,964,008
135 4,964,009

CLASS 361

18 4,964,010
88 4,964,011
113 4,964,012
4,964,013
187 4,964,014
220 4,964,015
321 4,964,016
390 4,964,017
391 4,964,018
401 4,964,019
429 4,964,020

CLASS 362

61 4,964,021
80 4,964,022
100 4,964,023
118 4,964,024
346 4,964,025

CLASS 363

39 4,964,026
40 4,964,027
80 4,964,029
056 4,964,028

CLASS 364

138 4,964,031
200 4,964,032
4,964,033
4,964,034
4,964,035
4,964,036
4,964,037
4,964,038
4,964,039
4,964,040
4,964,041
4,964,042
4,964,046
401 4,964,043
419 4,964,030
4,964,044
426.02 4,964,045
4,964,047
426.04 4,964,048
431.01 4,964,049
431.04 4,964,050
4,964,051
449 4,964,052
466 4,964,053
470 4,964,054
485 4,964,055
488 4,964,056
491 4,964,057
492 4,964,058
507 4,964,059
512 4,964,060
513 4,964,061
4,964,062
4,964,063
4,964,064
514 4,964,065
518 4,964,066
520 4,964,067
4,964,068
521 4,964,069
523 4,964,070
560 4,964,071
705.08 4,964,072
707 4,964,073
900 4,964,074
4,964,075
4,964,076
4,964,077

CLASS 365

51 4,964,078
168 4,964,079
185 4,964,080
189.06 4,964,081
189.09 4,964,082
189.11 4,964,083
226 4,964,084

CLASS 366

2 4,963,031
57 4,963,032
81 4,963,033

CLASS 367

31 4,964,101
35 4,964,085
38 4,964,086
45 4,964,087
47 4,964,102
51 4,964,088
53 4,964,103
70 4,964,096
73 4,964,089
4,964,097
4,964,098
4,964,099
99 4,964,104
162 4,964,090
165 4,964,091
4,964,106
178 4,964,100

CLASS 368

120 4,964,107
282 4,964,092
283 4,964,093

CLASS 369

19 4,964,108
44.11 4,964,109
59 4,964,094
110 4,964,110
215.000 4,964,111

CLASS 370

13 4,964,112
16 4,964,105
32.1 4,964,118
55 4,964,095
60 4,964,119
85.5 4,964,113
016 4,964,120
100.1 4,964,121
102 4,964,122

CLASS 371

12 4,964,123
15.1 4,964,124
20 4,964,125
36 4,964,126
37.1 4,964,127
39.1 4,964,128
40.2 4,964,129
4,964,130

CLASS 372

6 4,964,131
32 4,964,132
42 4,964,133
45 4,964,134
46 4,964,135
59 4,964,137
61 4,964,136

CLASS 373

94 4,964,114

CLASS 374

109 4,964,115

CLASS 375

1 4,964,138
11 4,964,116
23 4,964,139
36 4,964,140
106 4,964,141
108 4,964,117
118 4,964,142

CLASS 376

254 4,963,315
416 4,963,316
422 4,963,317
446 4,963,318
463 4,963,319

CLASS 377

15 4,964,144

CLASS 378

35 4,964,145
4,964,146
125 4,964,147
127 4,964,148
167 4,964,149
197 4,964,150
198 4,964,151
4,964,152
208 4,964,153

CLASS 379

100 4,964,154
136 4,964,155
189 4,964,156
204 4,964,157
322 4,964,158
356 4,964,159
412 4,964,160
452 4,964,161

CLASS 380

14 4,964,162
23 4,964,163
30 4,964,164
48 4,964,165

CLASS 381

34 4,964,166
36 4,963,034
4,964,168
40 4,964,169
52 4,964,167
69 4,964,170

CLASS 382

28 4,963,035
50 4,963,036

CLASS 383

24 4,963,037

CLASS 384

15 4,963,038
224 4,963,039
492 4,963,040
493 4,963,041

CLASS 400

17 4,963,042
196 4,963,043
486 4,963,044

CLASS 401

132 4,963,045
160 4,963,046
183 4,963,047
195 4,963,048

CLASS 402

79 4,963,049

CLASS 403

197 4,963,050
298 4,963,051
322 4,963,052

CLASS 404

26 4,963,053
34 4,963,054
41 4,963,055
69 4,963,056

CLASS 405

93 4,963,057
207 4,963,058

CLASS 407

60 4,963,059
114 4,963,060
4,963,061

CLASS 411

45 4,963,062
105 4,963,063
387 4,963,064

CLASS 414

217 4,963,065
376 4,963,066
400 4,963,067
401 4,963,068
416 4,963,069
492 4,963,070
723 4,963,071
797.6 4,963,072

CLASS 417

181 4,963,073
222 4,963,074
273 4,963,075
423.7 4,963,076
437 4,963,077
545 4,963,078

CLASS 418

83 4,963,079
260 4,963,080

CLASS 419

12 4,963,320
13 4,963,321
33 4,963,322

CLASS 420

422 4,963,323

CLASS 422

60 4,963,324
61 4,963,325
99 4,963,333
101 4,963,326
120 4,963,327
144 4,963,328
168 4,963,329
4,963,330
186.18 4,963,331
249 4,963,334
302 4,963,335

CLASS 423

56 4,963,336
230 Re.33,393
235 4,963,332
277 4,963,337
360 4,963,338
437 4,963,339
444 4,963,340
499 4,963,341
513 4,963,342
594 4,963,343

CLASS 424

9 4,963,344
10 4,963,345
46 L 4,963,365
49 4,963,346
4,963,347
71 4,963,348
72 4,963,349
73 4,963,350
4,963,351
4,963,352
74 4,963,353
85.1 4,963,354
85.8 4,963,355
91 4,963,356
94.64 4,963,357
440 4,963,359
443 4,963,360
4,963,361
450 4,963,362
4,963,363
455 4,963,364
485 4,963,367
498 4,963,368
548 4,963,358
601 4,963,366

CLASS 425

115 4,963,081
117 4,963,082
125 4,963,083
331 4,963,084
385 4,963,085
526 4,963,086
556 4,963,087

CLASS 426

5 4,963,369
7 4,963,370
69 4,963,371
72 4,963,372
74 4,963,373
107 4,963,374
233 4,963,375
243 4,963,376
283 4,963,377
302 4,963,378
306 4,963,379
330.3 4,963,380
490 4,963,381
548 4,963,382
573 4,963,383
580 4,963,384
602 4,963,385
611 4,963,386
649 4,963,387

CLASS 427

29 4,963,388
98 4,963,389
110 4,963,390
116 4,963,391
180 4,963,392
248.1 4,963,393
250 4,963,394
253 4,963,395
294 4,963,396
356 4,963,397
366 4,963,398
373 4,963,399
374.1 4,963,400
388.1 4,963,401

CLASS 428

1 4,963,402
31 4,963,403
34.7 4,963,404
34.9 4,963,418
36.7 4,963,419
36.9 4,963,420
4,963,421
40 4,963,405
43 4,963,406
47 4,963,407
71 4,963,408
90 4,963,422
96 4,963,409
100 4,963,410
123 4,963,411
137 4,963,412
192 4,963,413
195 4,963,414
199 4,963,415
209 4,963,423
212 4,963,424
213 4,963,425
215 4,963,426
4,963,427
B1 4,610,913
220 4,963,428
4,963,429
4,963,430
288 4,963,431
290 4,963,432
315.5 4,963,416
323 4,963,433
327 4,963,417
375 Re.33,392
378 4,963,434
379 4,963,435
403 4,963,436
432 4,963,437
447 4,963,438
614 4,963,439
651 4,963,440
690 4,963,441

CLASS 429

13 4,963,442
17 4,963,443
67 4,963,444
94 4,963,445
4,963,446
206 4,963,447

CLASS 430

20 4,963,448
59 4,963,449
4,963,450
72 4,963,451
78 4,963,452
96 4,963,453
106.6 4,963,454
4,963,455
109 4,963,456
138 4,963,457
4,963,458
4,963,459
4,963,460
4,963,461
143 4,963,462
191 4,963,463
281 4,963,470
282 4,963,471
303 4,963,472
309 4,963,473
393 4,963,474
467 4,963,475
495 4,963,464
506 4,963,465
551 4,963,466
567 4,963,467
574 4,963,476

CLASS 431

2 4,963,088
351 4,963,089

CLASS 432

23 4,963,090
176 4,963,091

CLASS 433

17 4,963,092
90 4,963,093
95 4,963,094
118 4,963,095

CLASS 434

21 4,963,096
431 4,963,097

CLASS 435

6 4,963,477
7 4,963,468
4,963,469
4,963,478
4,963,485
22 4,963,479
42 4,963,480
69.1 4,963,481
4,963,482
69.3 4,963,483
4,963,484
139 4,963,486
172.3 4,963,487
233 4,963,488
240.1 4,963,489
240.241 4,963,490
264 4,963,491
280 4,963,492
287 4,963,493
288 4,963,494
320 4,963,495
4,963,496
4,963,497

CLASS 436

69 4,963,498
147 4,963,499

CLASSIFICATION OF PATENTS

CLASS 437

8 4,963,500
40 4,963,501
41 4,963,502
4,963,503
44 4,963,504
62 4,963,505
101 4,963,506
130 4,963,507
132 4,963,508
142 4,963,509
192 4,963,510
4,963,511
4,963,512

CLASS 439

76 4,963,098
4,963,099
191 4,963,100
266 4,963,101
291 4,963,102
352 4,963,103
460 4,963,104
578 4,963,105
595 4,963,106
884 4,963,107

CLASS 440

75 4,963,109
81 4,963,108
89 4,963,110

CLASS 441

74 4,963,111

CLASS 445

7 4,963,112
25 4,963,114
58 4,963,113

CLASS 446

96 4,963,115
176 4,963,116
219 4,963,117

CLASS 453

3 4,963,118

CLASS 455

307 4,963,945

CLASS 464

24 4,963,119

CLASS 474

69 4,963,120
110 4,963,121
253 Re 33,389

CLASS 475

184 4,963,122
278 4,963,124

CLASS 493

334 4,963,125
354 4,963,126

CLASS 501

32 4,963,514
84 4,963,515
90 4,963,516
122 4,963,517

CLASS 502

62 4,963,518
63 4,963,519
64 4,963,520
207 4,963,521

CLASS 503

227 4,963,522

CLASS 505

1 4,963,523
4,963,524

CLASS 514

3 4,963,526
11 4,963,525
12 4,963,529
19 4,963,530
25 4,963,527
29 4,963,528
4,963,531
44 4,963,532
49 4,963,533
54 4,963,534
4,963,535
76 4,963,536
96 4,963,537
99 4,963,538
119 4,963,539
177 4,963,540
183 4,963,541
206 4,963,542
210 4,963,543
4,963,544
211 4,963,545
214 4,963,546
217 4,963,547
237.5 4,963,548
247 4,963,549
249 4,963,550
252 4,963,551
253 4,963,552
258 4,963,553
259 4,963,554
262 4,963,555
4,963,556
278 4,963,557
293 4,963,558
301 4,963,559
303 4,963,560
4,963,561
307 4,963,562
4,963,563
311 4,963,564
4,963,565
312 4,963,566
314 4,963,567
320 4,963,568
326 4,963,569
331 4,963,570
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DESIGN PATENTS

01 :	311,370		311,421		311,378	34 :	311,283		311,323	46 :	311,326
04 :	311,364		311,430		311,387		311,389		311,324	47 :	311,278
	311,416	08 :	311,276		311,442		311,413		311,333		311,372
	311,429	09 :	311,306	19 :	311,400	36 :	311,294		311,344	48 :	311,301
06 :	311,277		311,342		311,431		311,303		311,367		311,309
	311,288	10 :	311,336	22 :	311,327		311,385		311,419		311,368
	311,291	12 :	311,280	24 :	311,337		311,407		311,420		311,409
	311,292		311,340	25 :	311,269		311,438	40 :	311,266	51 :	311,403
	311,300		311,357		311,285		311,440		311,424		311,405
	311,325		311,369		311,346	37 :	311,272	41 :	311,268	53 :	311,270
	311,329		311,423		311,355		311,315	42 :	311,425		311,289
	311,331	13 :	311,359		311,386		311,393		311,371		311,345
	311,332	16 :	311,265	26 :	311,348	38 :	311,406		311,382		311,401
	311,338	17 :	311,284		311,404	39 :	311,281	44 :	311,275		311,434
	311,349		311,297	27 :	311,267		311,296		311,287	54 :	311,271
	311,408		311,313		311,384		311,311		311,432	55 :	311,298
	311,410		311,339		311,444		311,312		311,441		311,373
	311,414		311,436	33 :	311,390		311,319	45 :	311,437		311,439
	311,418	18 :	311,293								

PLANT PATENTS

06 :	7,355	12 :	7,357				

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